STR-V220

SERVICE MANUAL

US Model

This receiver incorporates the Dolby* Pro Logic Surround system.

* Manufactured under license from Dolby Laboratories Licensing Corporation.
DOLBY, the double-D symbol ◻◻ and "PRO LOGIC" are trademarks of Dolby Laboratories Licensing Corporation.

POWER OUTPUT AND TOTAL HARMONIC DISTORTION

With 8 ohm loads, both channels driven, from 20 - 20,000 Hz; rated 60 watts per channel minimum RMS power, with no more than 0.3% total harmonic distortion from 250 milliwatts to rated output.

Amplifier section

POWER OUTPUT

Stereo mode (8 ohms 20 Hz - 20 kHz, THD 0.3%)
60 W + 60 W

Surround mode (8 ohms at 1 kHz, THD 0.08%)
Front: 60 W/ch
Center*: 60 W
Rear*: 60 W/ch

* Depending on the surround mode and the source, sound will not be output.

SPECIFICATIONS

Frequency response
CD, TAPE/MD, TV/SAT, VIDEO:
10 Hz - 50 kHz ±1 dB

Inputs

	Sensitivity	Impedance	S/N (weighting network, input level)
CD	200 mV	50 kilohms	82 dB (A, 150 mV)
TAPE/MD, TV/SAT, VIDEO	150 mV		

Outputs
TAPE/MD REC OUT:
Voltage: 150 mV,
Impedance: 10 kilohms
VIDEO AUDIO OUT:
Voltage: 150 mV,
Impedance: 10 kilohms
MIX AUDIO OUT:
Voltage: 2 V
Impedance: 10 kilohms
PHONES:
Accepts low and high impedance headphones

MUTING Full mute

BASS BOOST +10 dB at 70 Hz

TONE ±8 dB at 100 Hz and 10 kHz

FM tuner section

Tuning range 87.5 - 108.0 MHz

Antenna terminals
300 ohms, balanced
75 ohms, unbalanced

Sensitivity
Mono: 18.3 dBf, 4.5 µV
Stereo: 38.3 dBf, 45 µV

Usable sensitivity
11.2 dBf, 2 µV (IHF)

S/N
Mono: 76 dB
Stereo: 70 dB

— Continued on next page —

FM STEREO/FM-AM RECEIVER

MICROFILM

SONY®

Harmonic distortion at 1 kHz
Mono: 0.3%
Stereo: 0.5%

Separation 45 dB at 1 kHz

Frequency response
30 Hz - 15 kHz $^{+0.5}_{-2}$ dB

Selectivity 60 dB at 400 kHz

AM tuner section

Tuning range With 10 kHz interval: 530 - 1710 kHz**

Antenna Loop antenna

Usable sensitivity
50 dB/m (at 1,000 kHz)

S/N 54 dB (at 50 mV/m)

Harmonic distortion
0.5% (50 mV/m, 400 Hz)

Selectivity At 10 kHz: 40 dB

** You can change the AM tuning interval to 9 kHz or to 10 kHz. After tuning in any AM station, turn off the receiver. Hold down the TUNING + button and press the I/⏻ button. All preset stations will be erased when you change the interval. To reset the interval to 10 kHz, repeat the procedure.

General

Power requirements
120 V AC, 60 Hz

Power consumption
130 W

AC outlets 1 switched, 120 W/1 A maximum

Dimensions 355 × 120 × 325 mm (14 × 4 3/4 × 12 3/4 inches) including projecting parts and controls

Mass (Approx.)
5.7 kg (12 lb 10 oz)

Supplied accessories
- FM wire antenna (1)
- AM loop antenna (1)
- Remote commander (remote) (1)
- Size AA (R6) batteries (2)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

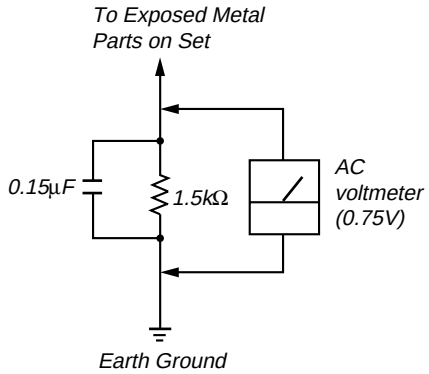


Fig. A. Using an AC voltmeter to check AC leakage.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

TABLE OF CONTENTS

1. SERVICING NOTE 3

2. GENERAL 4

3. ELECTRICAL BLOCK CHECKING 5

4. DIAGRAMS

4-1. Circuit Boards Location 6
4-2. Schematic Diagram – Main (1/3) Section – 7
4-3. Schematic Diagram – Main (2/3) Section – 9
4-4. Schematic Diagram – Main (3/3) Section – 11
4-5. Printed Wiring Board – Main Section – 13
4-6. Printed Wiring Board – Display Section – 15
4-7. Schematic Diagram – Display Section – 17
4-8. Schematic Diagram – Panel Section – 19
4-9. Printed Wiring Board – Panel Section – 21
4-10. IC Block Diagrams 23
4-11. IC Pin Functions 26

5. EXPLODED VIEWS

5-1. Case Section 28
5-2. Chassis Section 29

6. ELECTRICAL PARTS LIST 30

SECTION 1
SERVICING NOTE

FACTORY SET

Mode which sets the preset settings of the unit to that at shipment.

Procedure:

While pressing the [VIDEO] button and [TV/SAT] button together, press the [I/⏻] button to turn on the power.
"FACTORY" will be displayed and factory settings executed.

INITIALIZATION

Mode which erases all the preset settings of the unit.
Use this mode when returning the unit to the customer.

Procedure:

While pressing the [VIDEO] button, [TV/SAT] button, and [TAPE/MD] button together, press the [I/⏻] button to turn on the power.
"INITIAL" will be displayed and initialization executed.

FLUORESCENT INDICATOR TUBE LIGHTING CHECK

Mode which lights up the whole fluorescent indicator tube or partially.

Procedure:

While pressing the [TV/SAT] button and [TAPE/MD] button together, press the [I/⏻] button to turn on the power.
The fluorescent indicator tube will light up in about 0.5 seconds, and then start to light up partially. After partial lighting completes, the [BASS BOOST] indicator will light up, "FINISH" will be displayed, indicating that fluorescent indicator tube lighting check has completed.

SWITCHING OF 9 kHz/10 kHz AM CHANNEL STEP

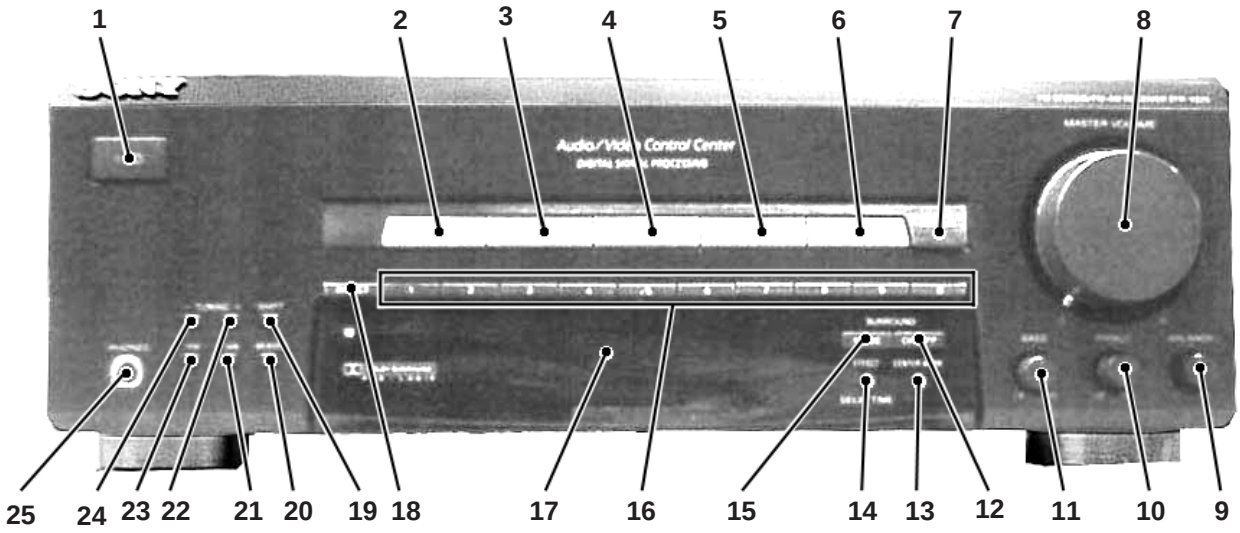
The AM channels of this unit can be switched between 9 kHz and 10 kHz.

Procedure:

Set FUNCTION to AM and turn off the power.
While pressing the [TUNING +] button, press the [I/⏻] button to turn on the power.
"9 k STEP" or "10 k STEP" will be displayed, and the channel step will be switched.

SECTION 2
GENERAL

Front Panel Descriptions

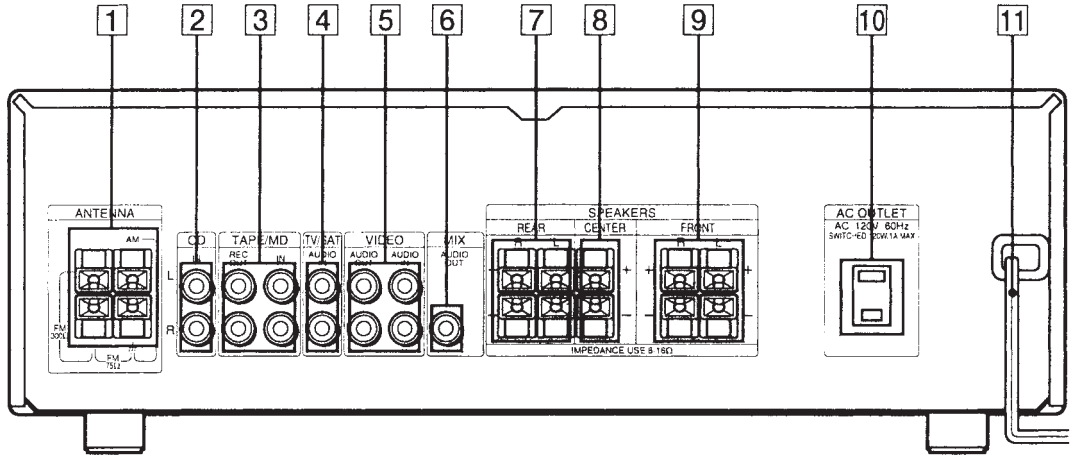


Location of Parts and Controls

1 I/⏻ button
2 VIDEO button
3 TV/SAT button
4 TAPE/MD button
5 CD button
6 TUNER button
7 BASS BOOST indicator
8 MASTER VOLUME knob
9 BALANCE knob
10 TREBLE knob
11 BASS knob
12 SURROUND ON/OFF button
13 CENTER MODE button
14 EFFECT/DELAY TIME button
15 SURROUND MODE button
16 Numeral (1 to 0) button
17 Display window
18 DIRECT button
19 SHIFT button
20 MEMORY button
21 AM button
22 TUNING + button
23 FM button
24 TUNING – button
25 PHONES jack

This section is extracted from instruction manual.

Rear Panel Descriptions

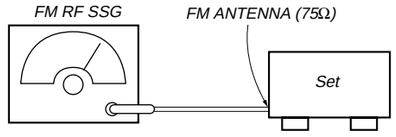


1 ANTENNA
2 CD
3 TAPE/MD
4 TV/SAT
5 VIDEO
6 MIX AUDIO OUT
7 REAR
8 CENTER
9 FRONT
10 AC OUTLET
11 AC power cord

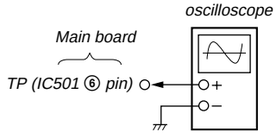
SECTION 3
ELECTRICAL BLOCK CHECKING

ADJUSTING THE FM/SD SIGNAL SENSITIVITY

Setting:



Carrier frequency: 98 MHz
Modulation: AUDIO 1 kHz,
75 kHz deviation (100%)
Output level: 26 dB (at 75 Ω open) (MAX 35 dB)



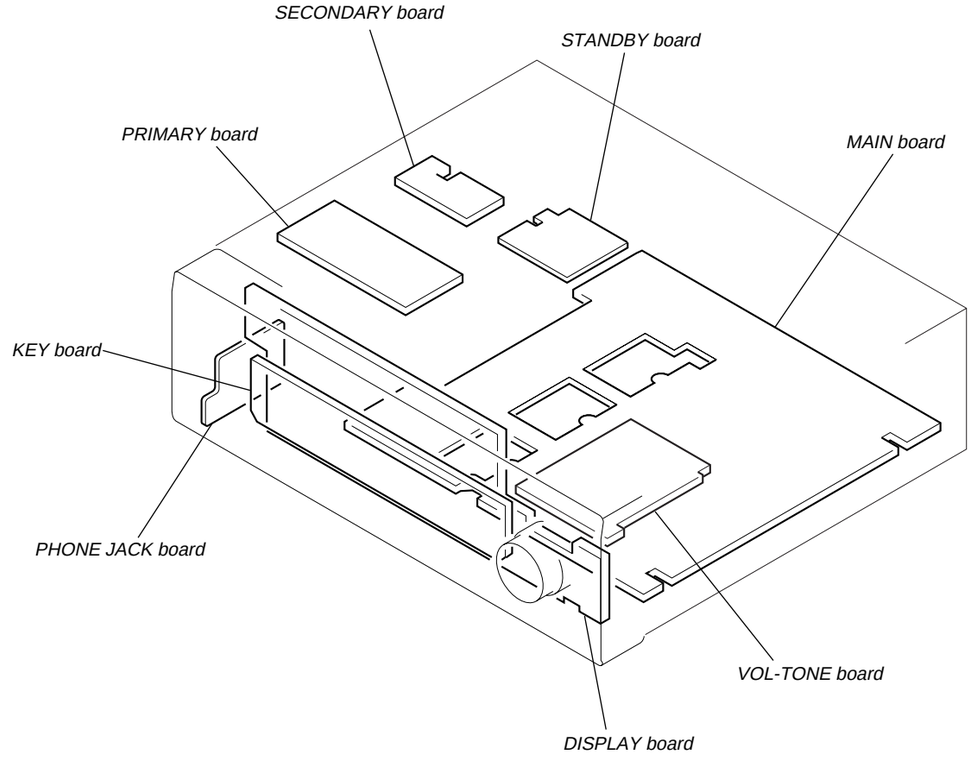
Procedure:

1. Set the SSG output level to 26 dB and input the signal.
2. Adjust SFR501 so that the oscilloscope level becomes 0V.
3. Raise the SSG output level slightly (max. 35 dB) when the adjustment in step 2 fails, and repeat steps 1 and 2.

NOTE: If the adjustment cannot be performed even when set to 35 dB, the sensitivity may be faulty, etc. Check the antenna terminal connection, FM front end and IF circuit, etc. and perform adjustments again.

SECTION 4
DIAGRAMS

4-1. CIRCUIT BOARDS LOCATION



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For schematic diagrams.

Note:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- : nonflammable resistor.
- : panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B+ : B+ Line.
- B– : B– Line.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM

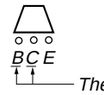
For printed wiring boards.

Note:

- ○——— : parts extracted from the component side.
- ▒▒▒ : Pattern of the conductor side.

Caution:
Pattern face side: (Conductor Side) — Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side) — Parts on the parts face side seen from the parts face are indicated.

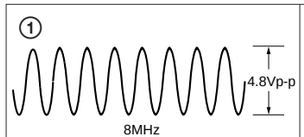
- **Indication of transistor**



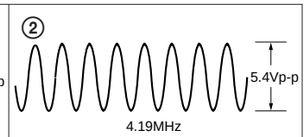
These are omitted

WAVEFORMS

MAIN (1/3) SECTION

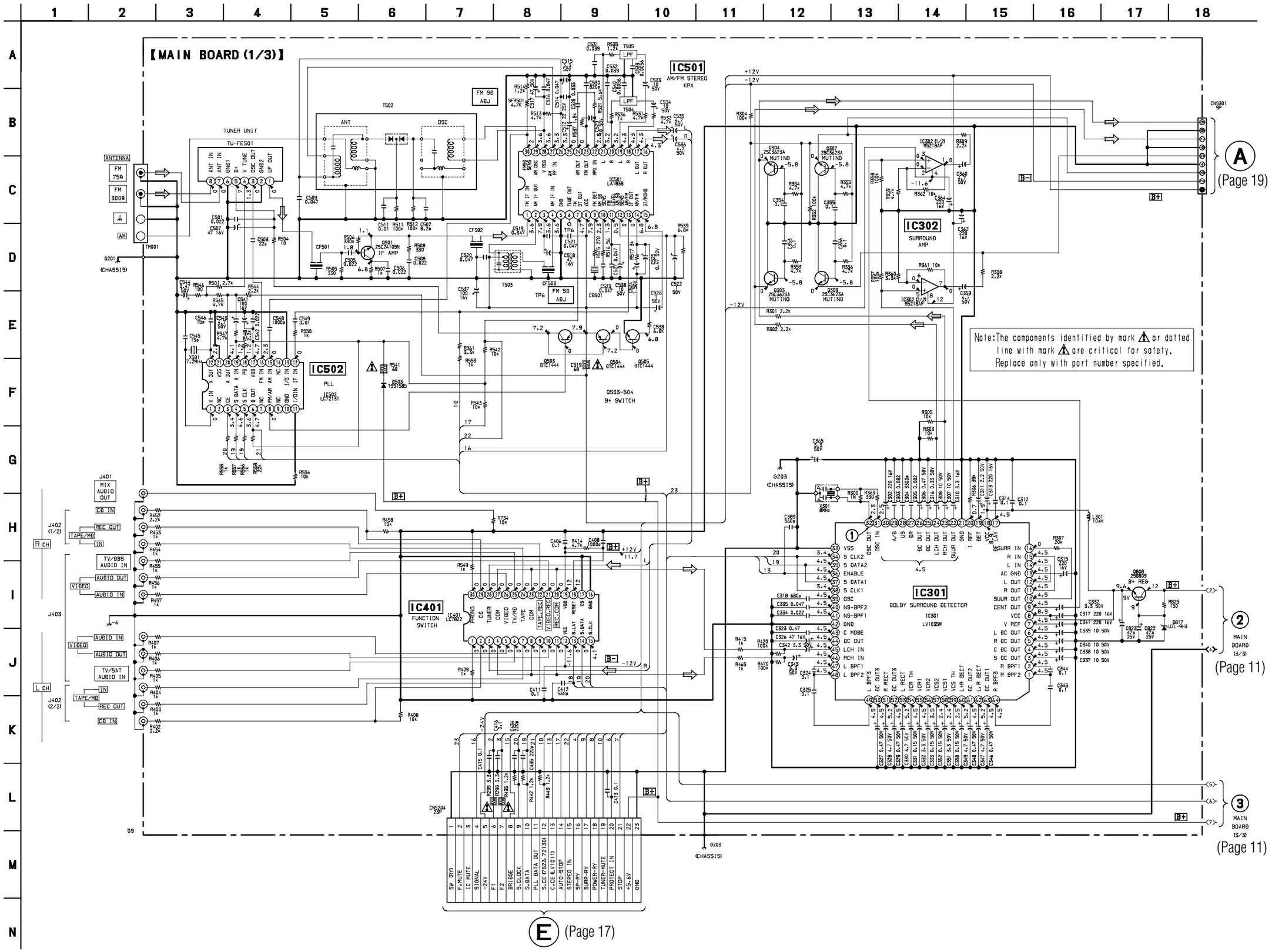


DISPLAY SECTION



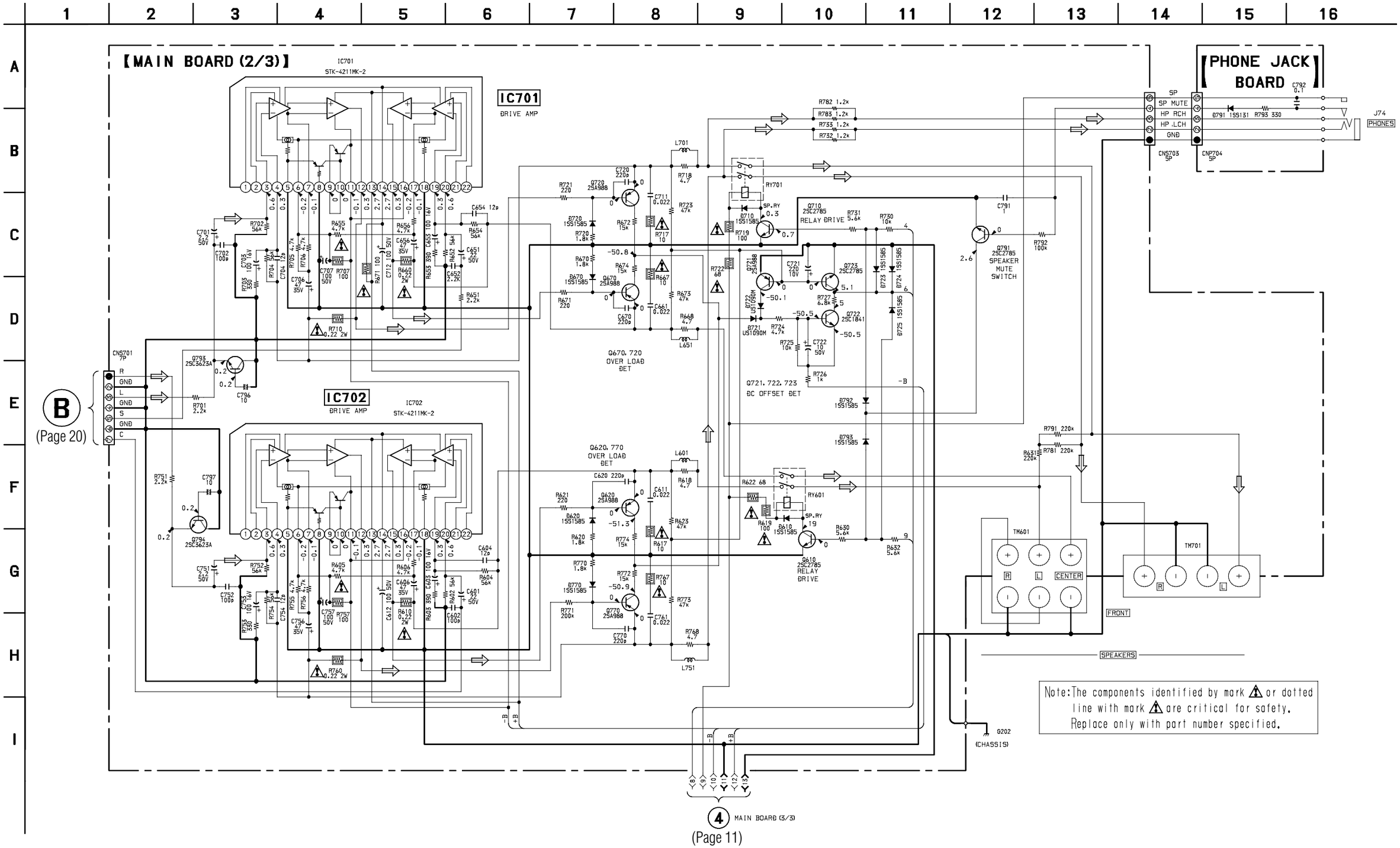
4-2. SCHEMATIC DIAGRAM – MAIN (1/3) SECTION –

- See page 6 for Waveforms.
- See page 13 for Printed Wiring Board.
- See page 23 for IC Block Diagrams.



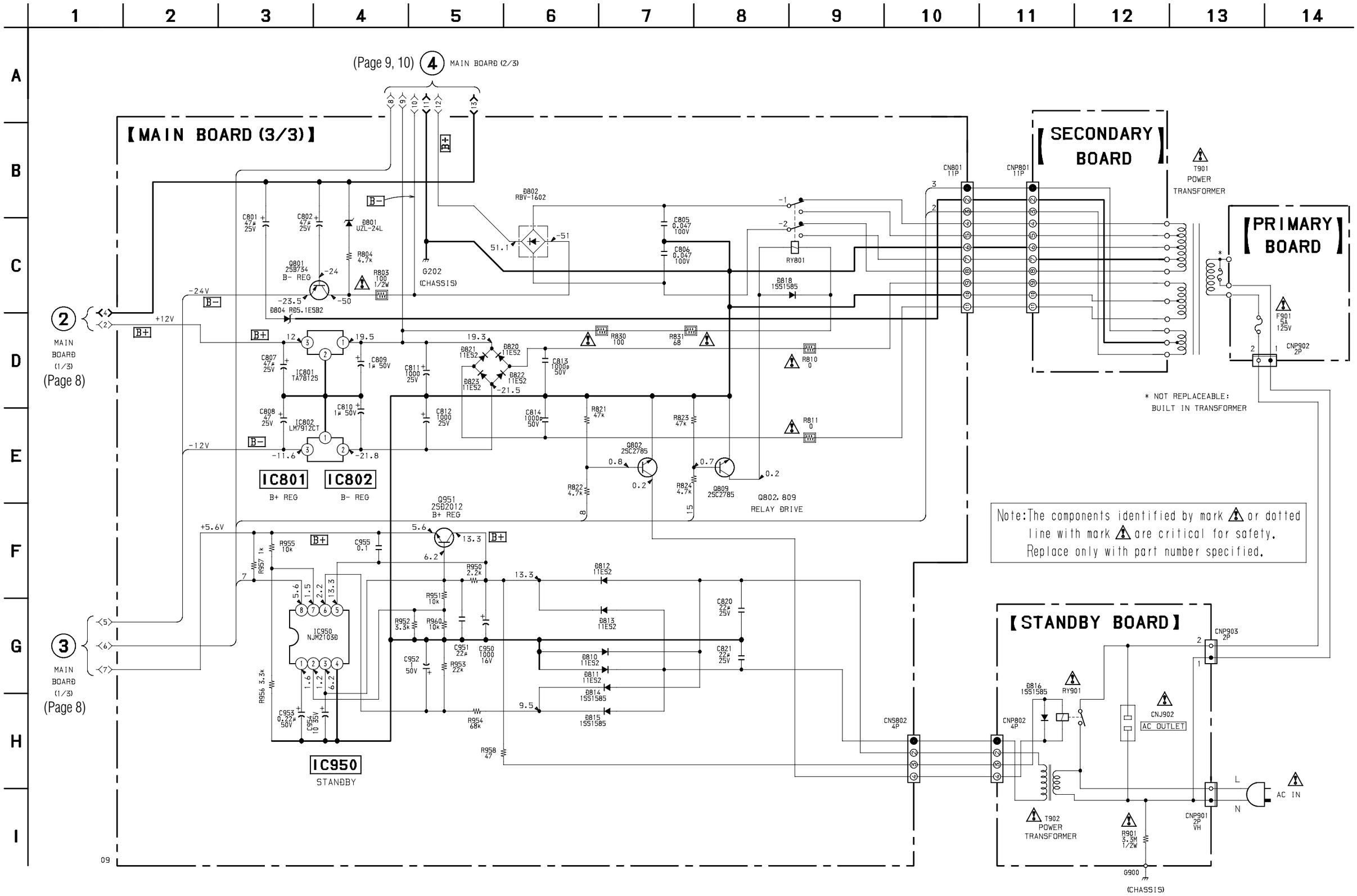
4-3. SCHEMATIC DIAGRAM – MAIN (2/3) SECTION –

• See page 13 for Printed Wiring Board.



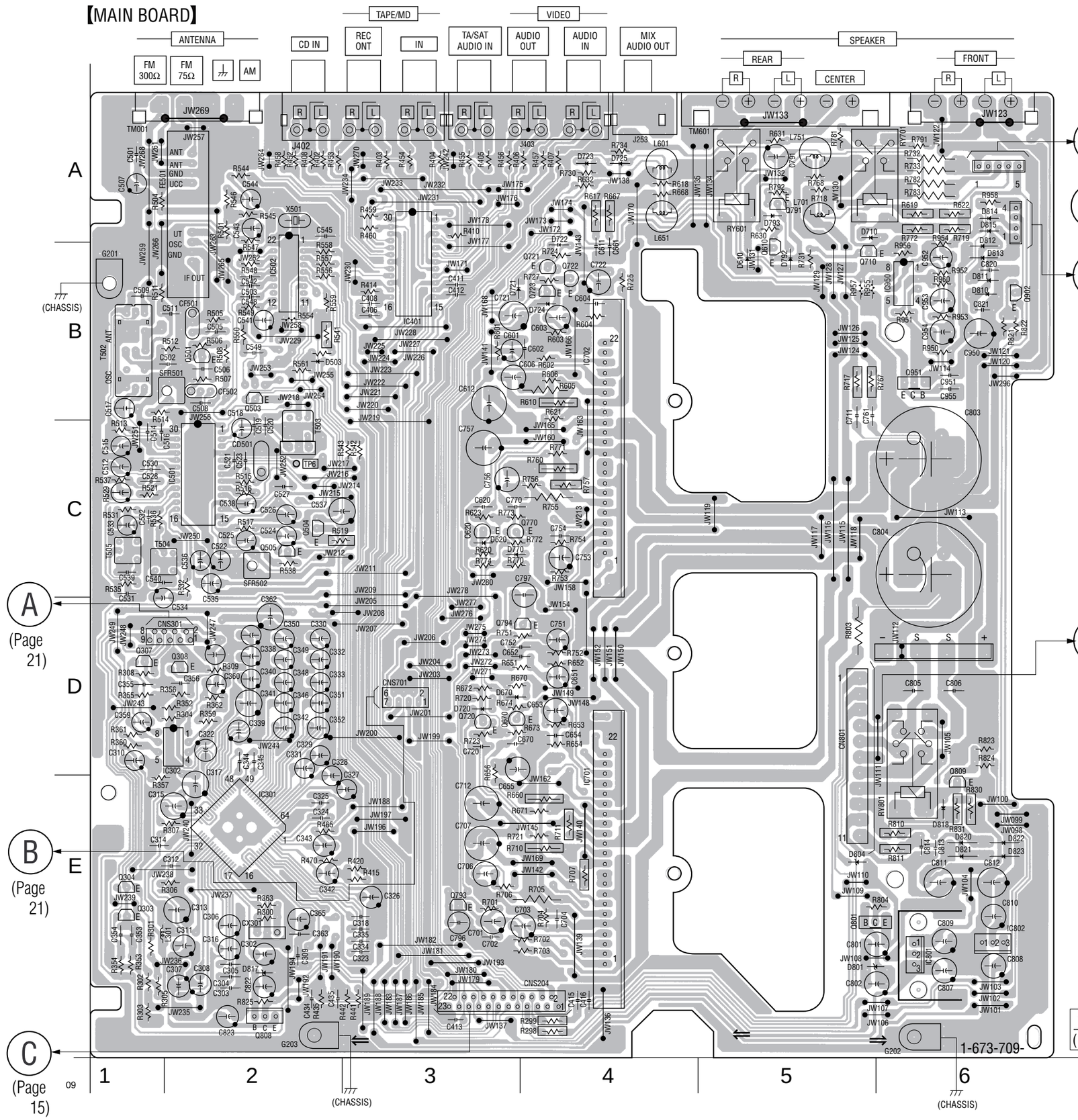
4-4. SCHEMATIC DIAGRAM – MAIN (3/3) SECTION –

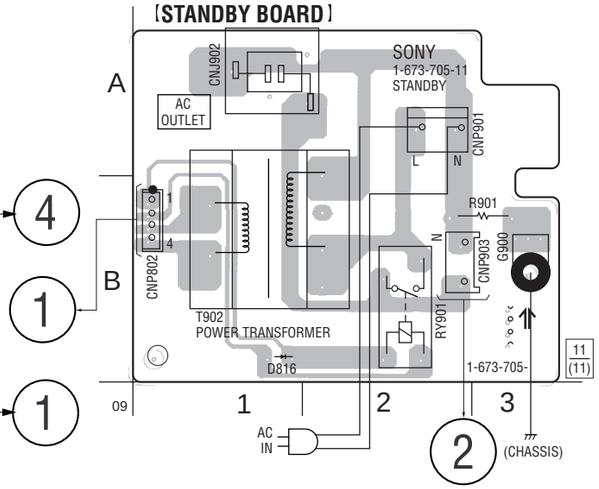
• See page 24 for IC Block Diagrams.

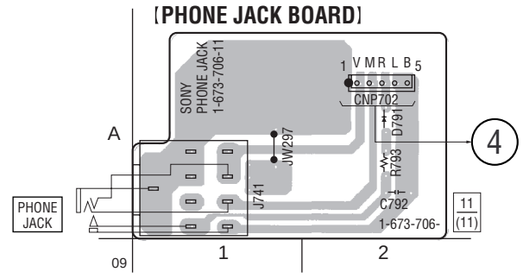


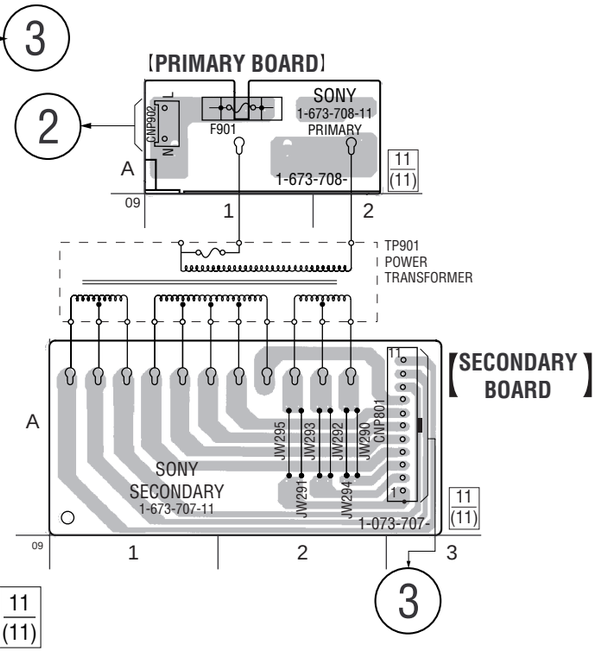
4-5. PRINTED WIRING BOARD – MAIN SECTION –

• See page 6 for Circuit Boards Location.









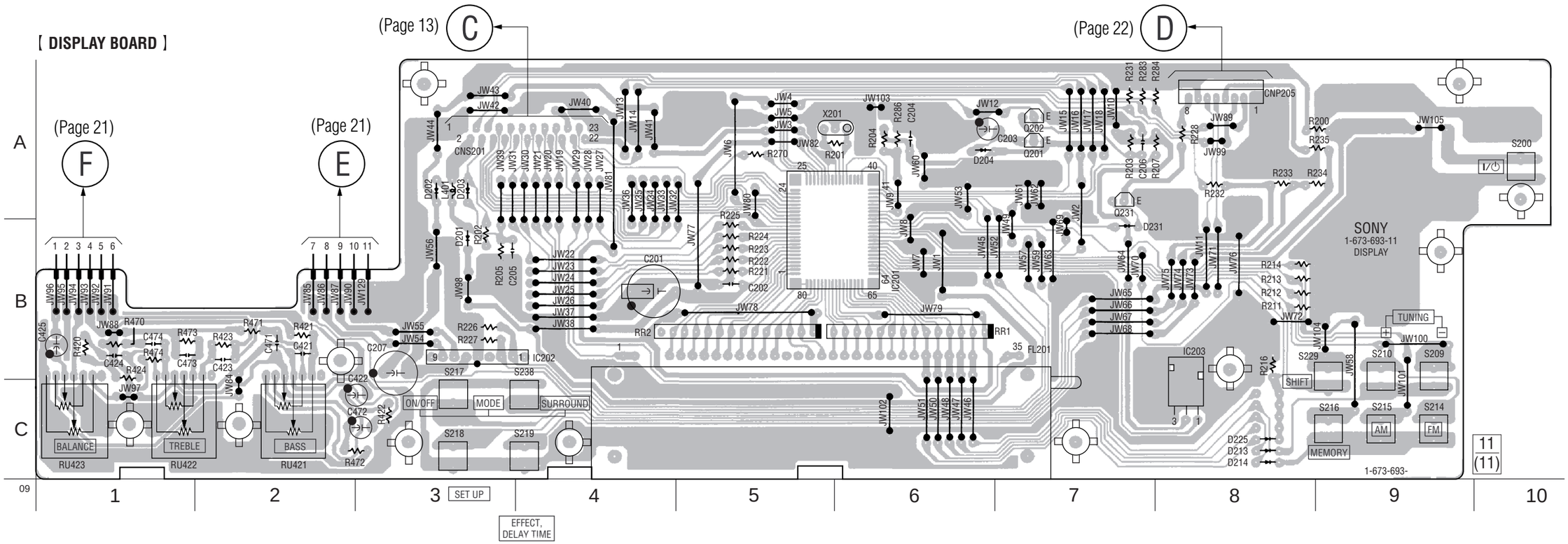
- **Semiconductor Location**

Ref. No.	Location
D503	B-2
D610	B-5
D620	C-3
D670	D-3
D710	B-5
D720	D-3
D721	B-4
D722	B-4
D723	A-4
D724	B-4
D725	A-4
D770	C-3
D792	B-5
D793	A-5
D801	E-6
D802	D-6
D804	E-5
D810	B-6
D811	B-6
D812	B-6
D813	B-6
D814	A-6
D815	A-6
D817	E-1
D818	E-6
D820	E-6
D821	E-6
D822	E-6
D823	E-6
IC301	E-2
IC302	D-2
IC401	B-3
IC501	C-2
IC502	B-2
IC701	E-4
IC702	C-4
IC801	E-6
IC802	E-6
IC950	B-6
Q303	E-1
Q304	E-1
Q307	D-1
Q308	D-2
Q501	B-2
Q503	B-2
Q504	C-2
Q505	C-2
Q610	B-5
Q620	C-3
Q670	D-3
Q710	B-5
Q720	D-3
Q721	B-4
Q722	B-4
Q723	B-4
Q770	C-4
Q791	A-5
Q793	E-3
Q794	D-4
Q801	E-5
Q802	B-6
Q808	E-2
Q809	E-6
Q951	B-6

4-6. PRINTED WIRING BOARD – DISPLAY SECTION –

• See page 6 for Circuit Boards Location.

【 DISPLAY BOARD 】

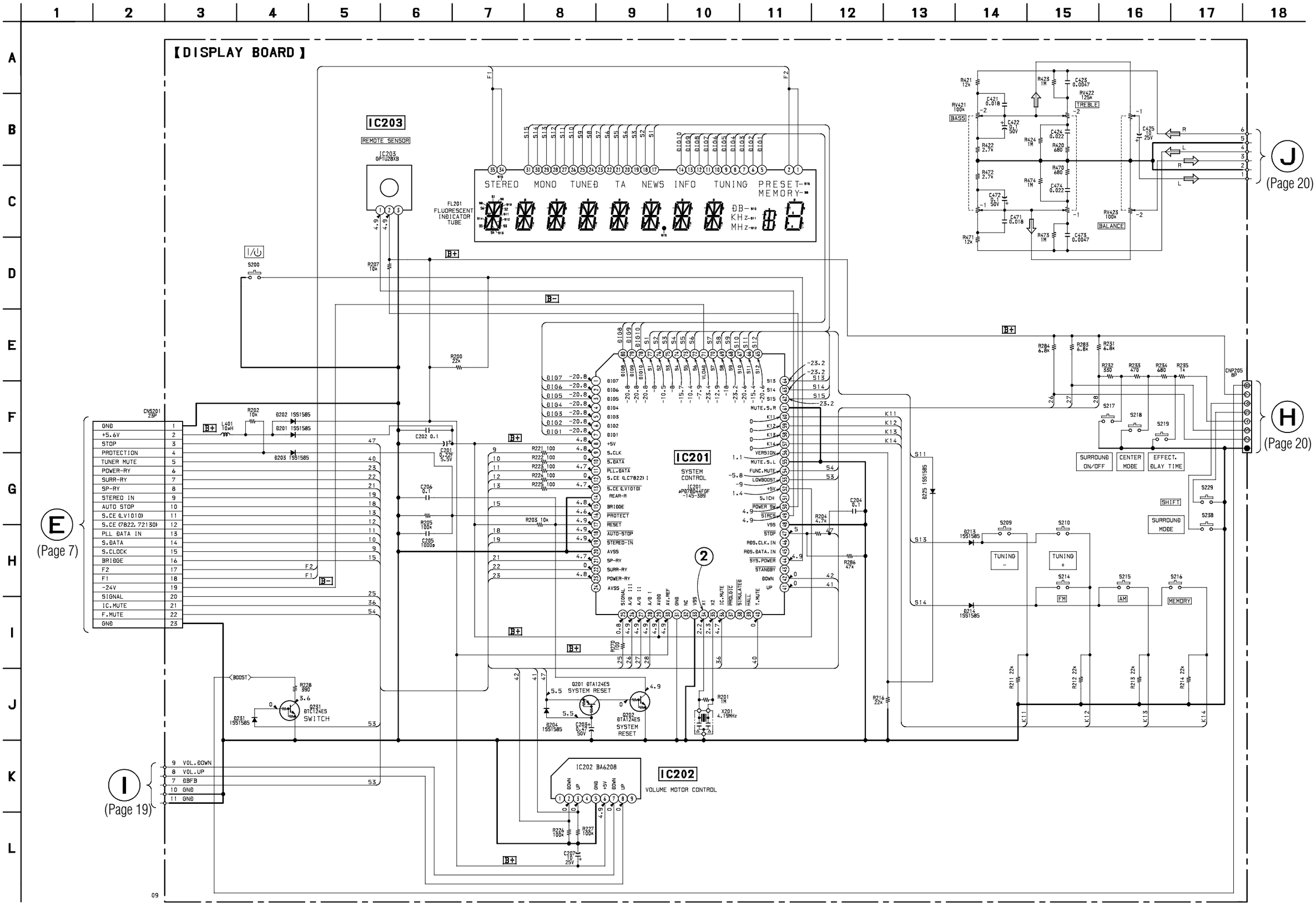


- **Semiconductor Location**

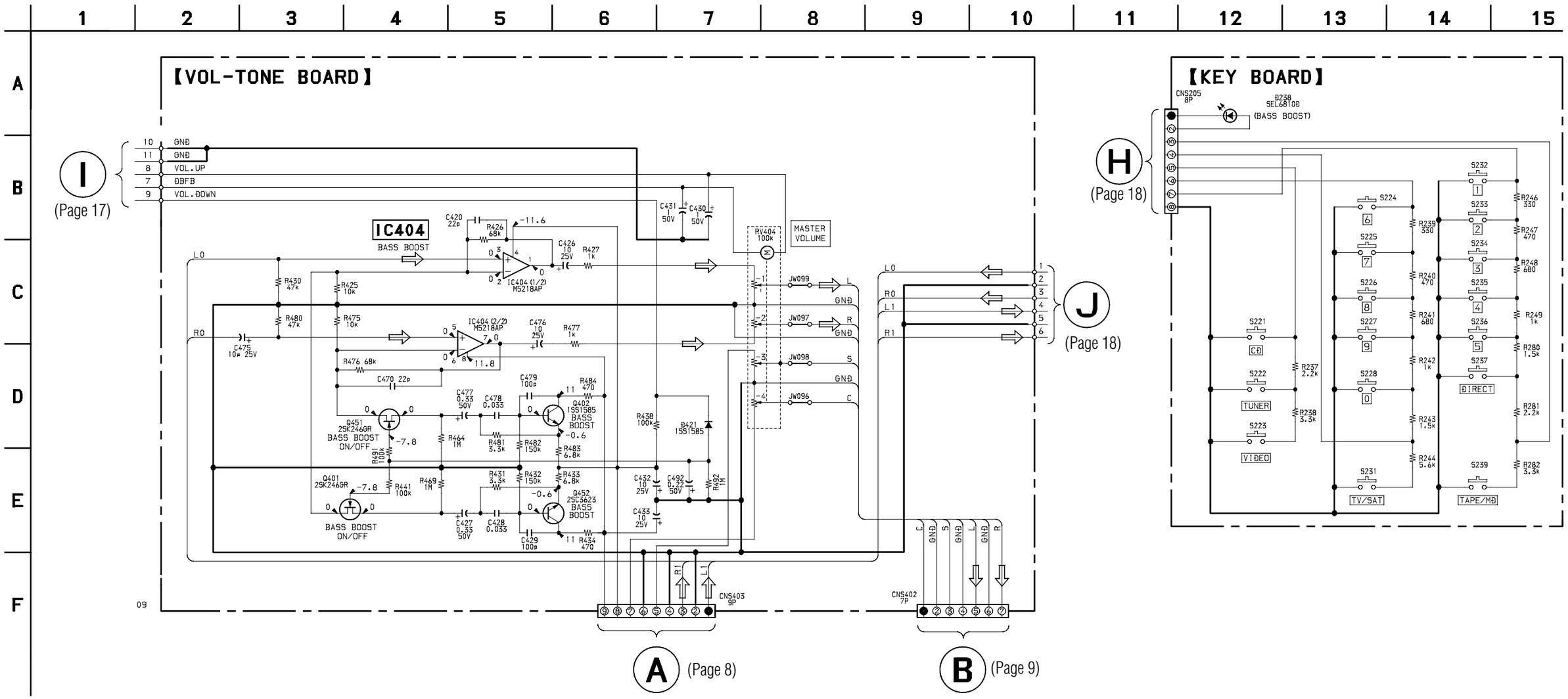
Ref. No.	Location
D201	B-3
D202	A-3
D203	A-3
D204	A-6
D213	C-8
D214	C-8
D225	C-8
D231	A-7
IC201	B-5
IC202	B-3
IC203	C-8
Q201	A-7
Q202	A-7
Q231	A-7

4-7. SCHEMATIC DIAGRAM – DISPLAY SECTION –

- See page 6 for Waveforms.
- See page 25 for IC Block Diagrams.
- See page 26 for IC Pin Function.



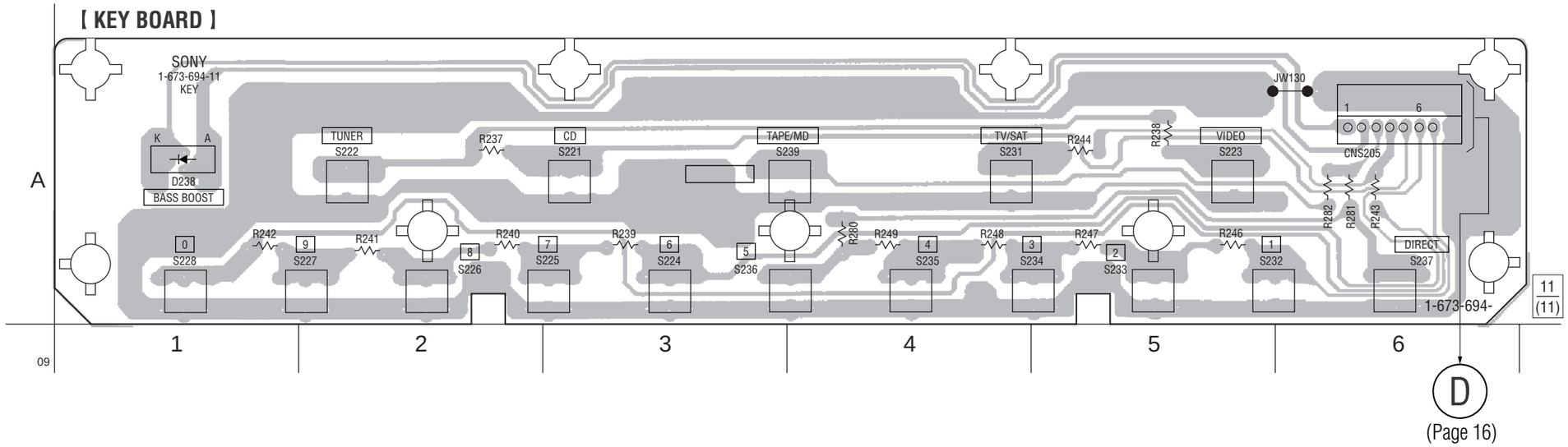
4-8. SCHEMATIC DIAGRAM – PANEL SECTION –



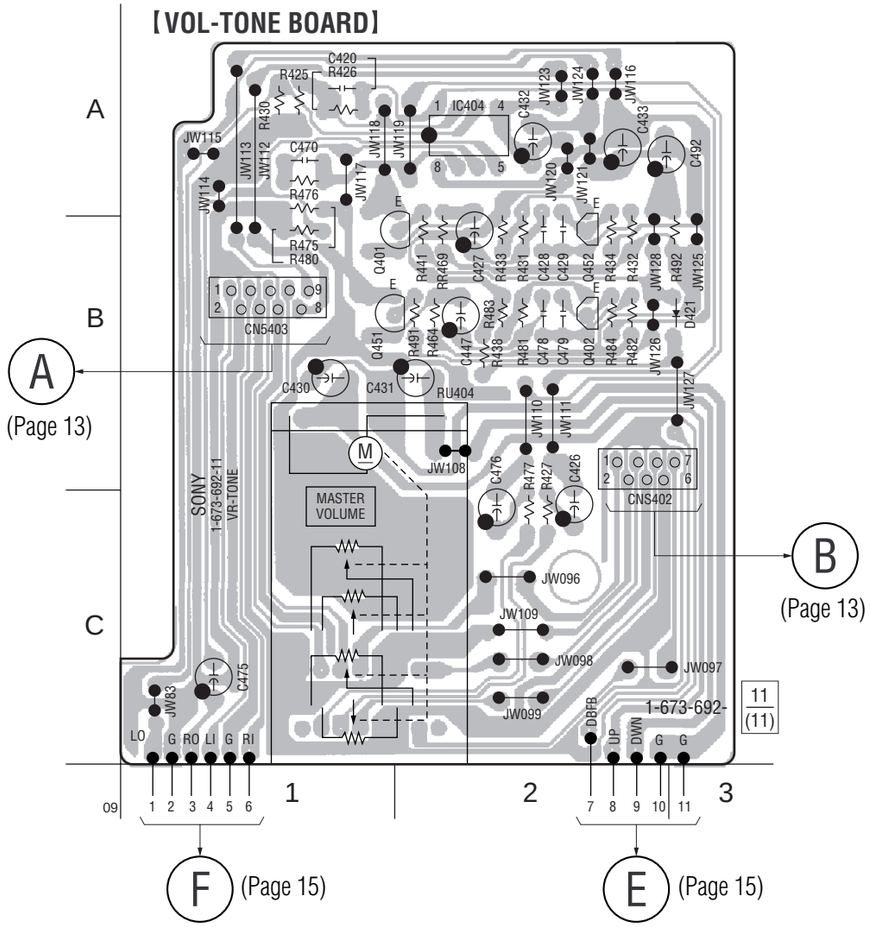
4-9. PRINTED WIRING BOARD – PANEL SECTION –

• See page 6 for Circuit Boards Location.

【KEY BOARD】



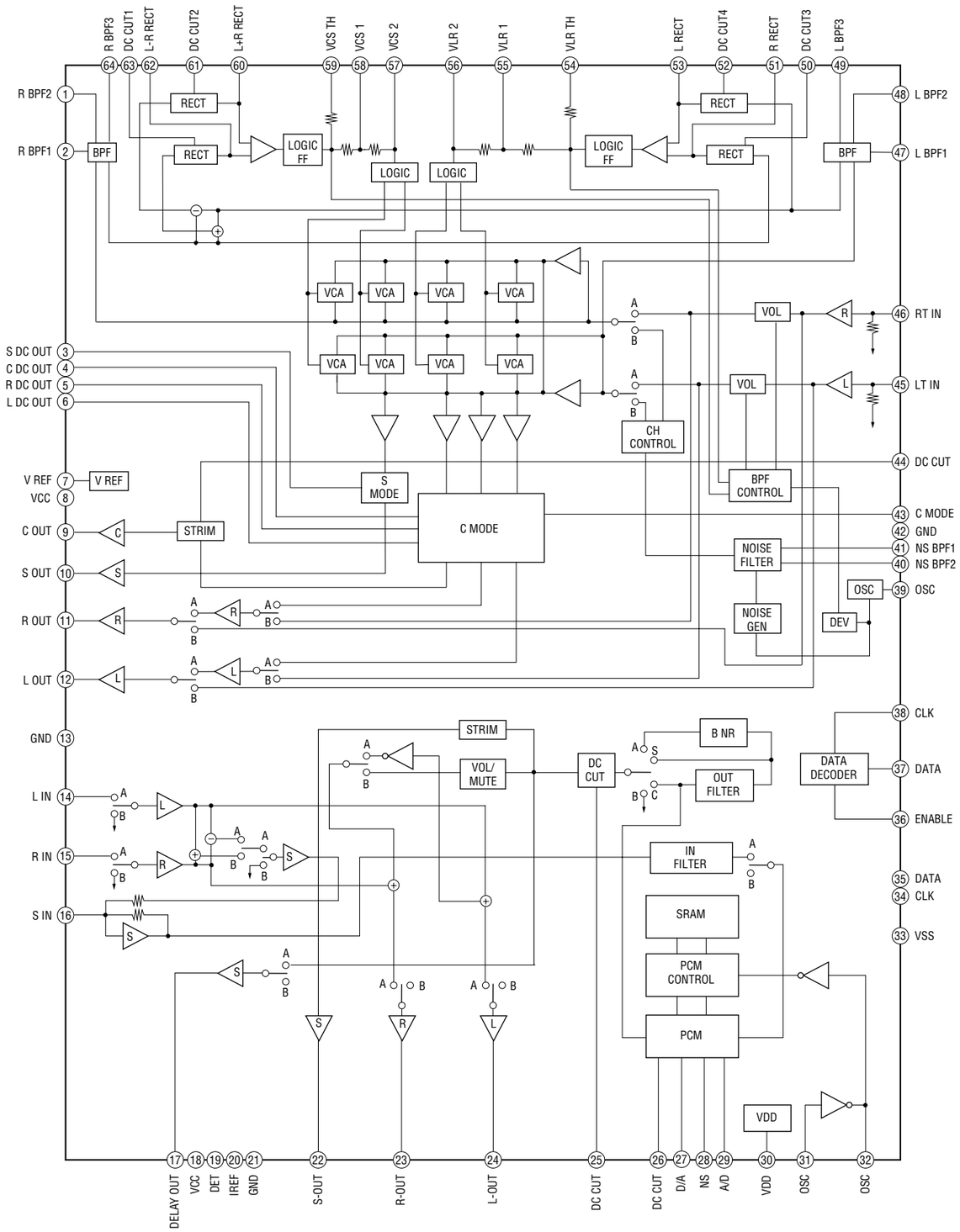
【VOL-TONE BOARD】



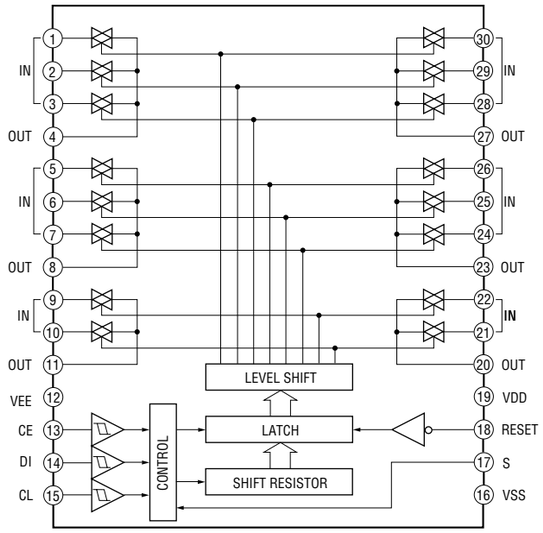
4-10. IC BLOCK DIAGRAMS

• Main section

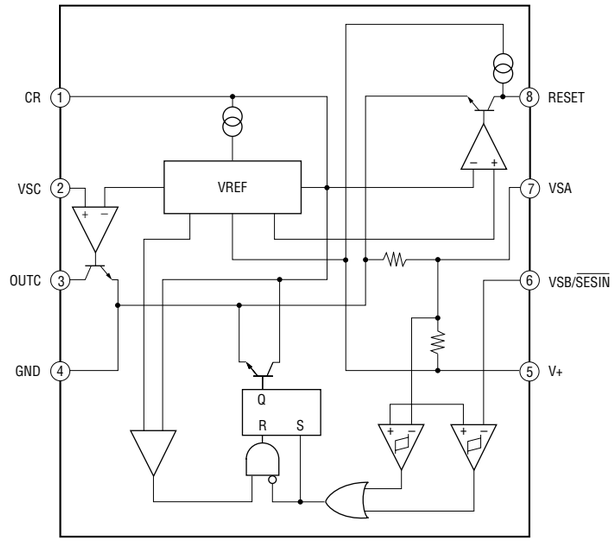
IC301 LV1035M



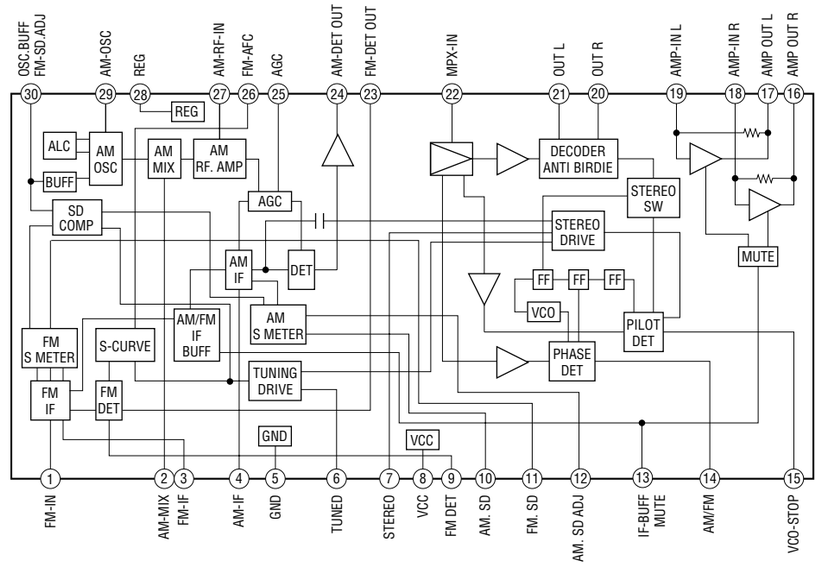
IC401 LC7822



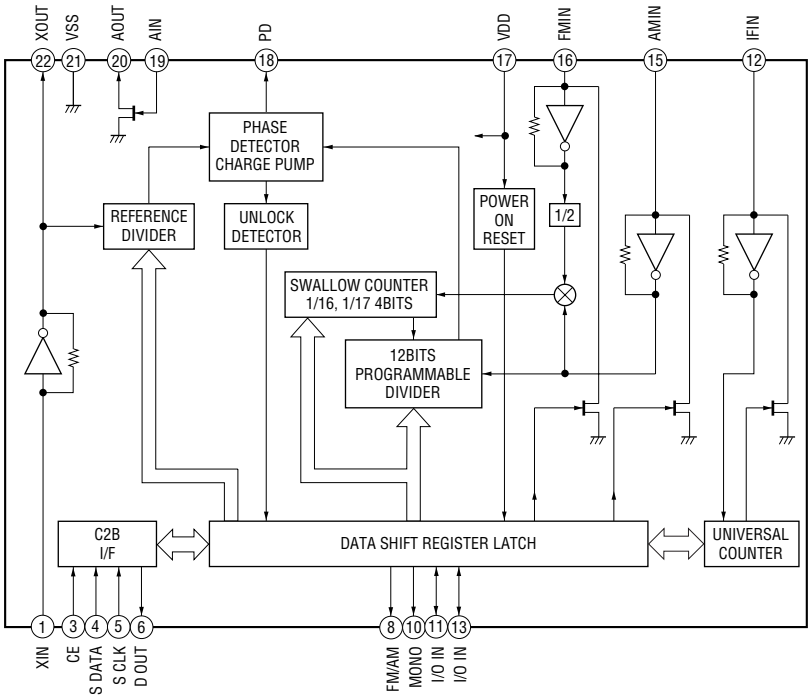
IC950 NJM2103D



IC501 LA1838

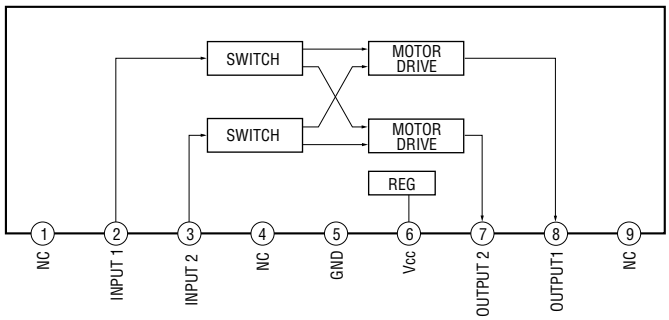


IC502 LC72131



• Display section

IC202 BA6208



4-11. IC PIN FUNCTION

• IC201 uPD78044FGF-145-3B9 (Display board)

Pin No.	Pin Name	I/O	Function
1	DIG7	O	Fluorescent indicator tube drive
2	DIG6	O	
3	DIG5	O	
4	DIG4	O	
5	DIG3	O	
6	DIG2	O	
7	DIG1	O	
8	+5V	—	Power supply (+5V)
9	$\overline{\text{S. CLK}}$	I	System clock
10	$\overline{\text{S. DATA}}$	I	System data
11	$\overline{\text{PLL. DATA}}$	I	PLL data input from TU001
12	S. CE (LC7288)	O	Chip enable output
13	$\overline{\text{S. CE (LV1010)}}$	O	Chip enable output
14	REAR-R	I	Input for model select (Connected to ground)
15	BRIDGE	I	Protector detect input
16	$\overline{\text{PROTECT}}$	I	Protector detect input
17	$\overline{\text{RESET}}$	I	System reset terminal
18	$\overline{\text{AUTO-STOP}}$	I	Auto stop detect input
19	$\overline{\text{STEREO-IN}}$	I	Stereo detect input
20	AVSS	—	Ground
21	SP-RY	O	Speaker relay drive
22	SURR-RY	O	Surround Relay
23	POWER-RY	O	Power relay drive
24	AVSS	—	Ground (Not used)
25	SIGNAL	I	A/D signal input terminal
26	A/D3	I	A/D3 key input terminal
27	A/D2	I	A/D2 key input terminal
28	A/D1	I	A/D1 key input terminal
29	AVDD	—	Power supply (+5V)
30	AV. REF	—	Reference voltage (+5V)
31	GND	—	Ground
32	NC	—	Not used (Open)
33	VSS	—	Ground
34	X1	I	System clock (4.19MHz)
35	X2	O	System clock (4.19MHz)
36	IC. MUTE	O	Mute drive output for µPD2581V (IC701)
37	$\overline{\text{PROLOGIC}}$	O	Plologic LED (Not used)
38	$\overline{\text{SIMULATED}}$	O	CINEMA STUDIO LED (Not used)
39	$\overline{\text{HALL}}$	O	HALL LED (Not used)
40	T. MUTE	O	Tuner mute drive output

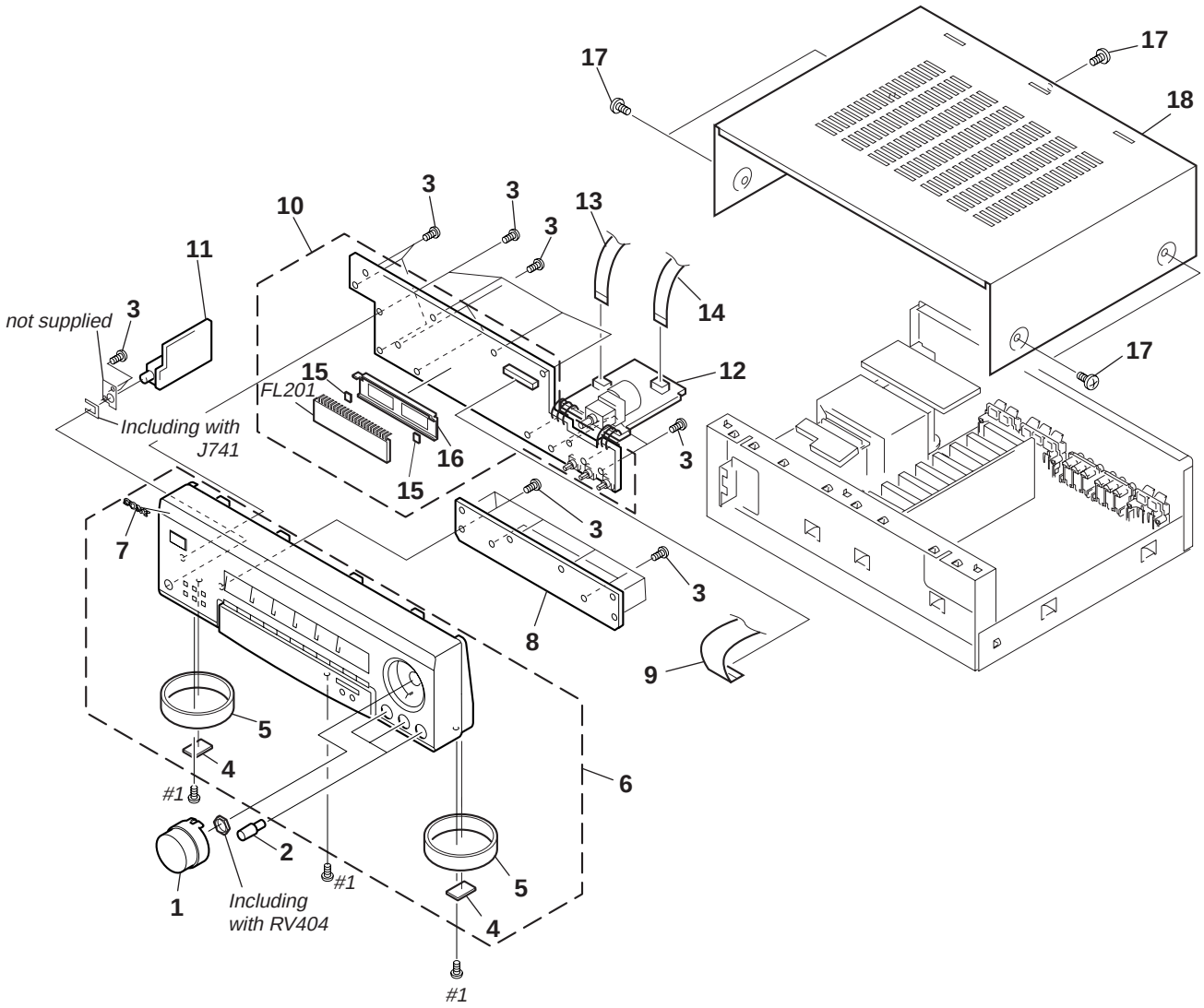
Pin No.	Pin Name	I/O	Function
41	VOLUME UP	O	Volume up
42	VOLUME DOWN	O	Volume down
43	$\overline{\text{STANDBY}}$	O	Standby LED drive (Not used)
44	$\overline{\text{SYS. POWER}}$	I	System power ON/OFF
45	RDS. DATA. IN	I	RDS data input (Not used)
46	RDS. CLK. IN	I	RDS clock input (Not used)
47	$\overline{\text{STOP}}$	I	Stop signal input from NJM2103D (IC950)
48	VSS	—	Ground
49	$\overline{\text{SIRCS}}$	I	Sircs signal input
50	POWER SW	I	Power switch input terminal
51	5.1ch LED	—	5.1ch LED drive (Not used)
52	+5V	—	Power supply (+5V)
53	BASS BOOST	I	Bass boost LED drive
54	FUNC. MUTE	O	Line mute drive
55	SL MUTE	O	SL mute drive
56	VERSION	I	Input for model select
57	K14	I	Key in 4
58	K13	I	Key in 3
59	K12	I	Key in 2
60	K11	I	Key in 1
61	SR MUTE	O	SR mute drive
62	S15	O	Not used
63	S14	O	Fluorescent indicator tube drive
64	S13	O	
65	S12	O	
66	S11	O	
67	S10	O	
68	S9	O	
69	S8	O	
70	S7	O	
71	VLOAD	—	Connect to –24V
72	S6	O	Fluorescent indicator tube drive
73	S5	O	
74	S4	O	
75	S3	O	
76	S2	O	
77	S1	O	
78	DIG10	O	Fluorescent indicator tube drive
79	DIG9	O	
80	DIG8	O	

SECTION 5
EXPLODED VIEWS

NOTE:
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

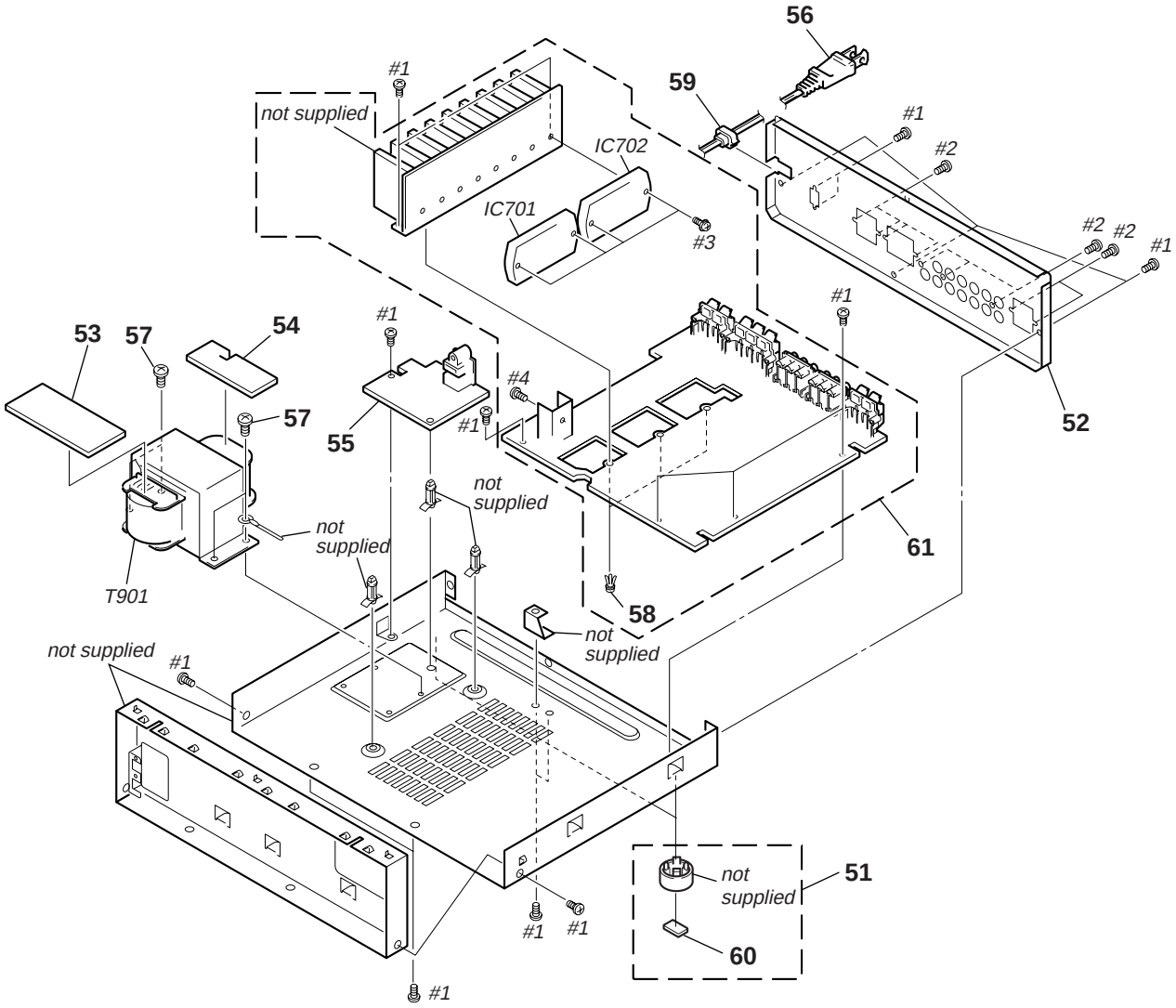
5-1. CASE SECTION



Ref. No.	Part No.	Description	Remark
1	A-4411-215-A	KNOB ASSY	
2	4-210-373-01	KNOB (EQ)	
3	4-951-620-01	SCREW (2.6X8), +BVTP	
* 4	4-978-398-21	CUSHION	
5	4-977-593-01	RING (DIA. 50), ORNAMENTAL	
6	A-4411-579-A	PANEL ASSY, FRONT	
7	4-996-698-41	EMBLEM, SONY	
8	A-4419-637-A	KEY BOARD, COMPLETE	
9	1-782-100-11	WIRE (FLAT TYPE) (23 CORE)	
10	A-4419-636-A	DISPLAY BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remark
11	1-673-706-11	PHONE JACK BOARD	
12	A-4419-635-A	VOL-TONE BOARD, COMPLETE	
13	1-782-074-11	WIRE (FLAT TYPE) (7 CORE)	
14	1-782-075-11	WIRE (FLAT TYPE) (9 CORE)	
* 15	4-921-941-01	CUSHION (FL)	
* 16	4-210-383-01	HOLDER (FL TUBE)	
17	3-704-366-31	SCREW (CASE) (M3X6)	
* 18	4-210-365-01	CASE	
FL201	1-517-141-11	INDICATOR TUBE, FLUORESCENT	

5-2. SHASSIS SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	X-4947-412-1	FOOT (SMALL) ASSY	
52	4-210-367-11	PANEL, BACK	
53	1-673-708-11	PRIMARY BOARD	
54	1-673-707-11	SECONDARY BOARD	
55	1-673-705-11	STANDBY BOARD	
⚠56	1-783-531-21	CORD, POWER	

Ref. No.	Part No.	Description	Remark
57	4-900-386-01	SCREW	
58	4-210-380-01	RIVET, NYLON	
* 59	3-703-244-00	BUSHING (2104), CORD	
* 60	4-978-398-21	CUSHION	
61	A-4419-639-A	MAIN BOARD, COMPLETE	
⚠T901	1-431-258-31	TRANSFORMER, POWER	

DISPLAY

SECTION 6
ELECTRICAL PARTS LIST

Note:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: µ , for example:
  uA...: µ A..., uPA...: µ PA..., uPB...: µ PB..., uPC...: µ PC..., uPD...: µ PD...
- CAPACITORS
  uF : µ F
- COILS
  uH : µ H

Ref. No.	Part No.	Description			Remark
	A-4419-636-A	DISPLAY BOARD, COMPLETE			
		**********			
*	4-210-383-01	HOLDER (FL TUBE)			
*	4-921-941-01	CUSHION (FL)			
		< CAPACITOR >			
C201	1-104-905-11	CAPACITOR	0.22F		5.5V
C202	1-164-159-21	CERAMIC	0.1uF		50V
C203	1-124-465-00	ELECT	0.47uF	20%	50V
C204	1-164-159-21	CERAMIC	0.1uF		50V
C205	1-162-294-31	CERAMIC	0.001uF	10%	50V
C206	1-164-159-21	CERAMIC	0.1uF		50V
C207	1-126-096-11	ELECT	10uF	20%	35V
C421	1-137-440-11	FILM	0.018uF	5%	50V
C422	1-124-463-00	ELECT	0.1uF	20%	50V
C423	1-137-368-11	FILM	0.0047uF	5%	50V
C424	1-137-372-11	FILM	0.022uF	5%	50V
C425	1-126-795-11	ELECT	10uF	20%	25V
C471	1-137-440-11	FILM	0.018uF	5%	50V
C472	1-124-463-00	ELECT	0.1uF	20%	50V
C473	1-137-368-11	FILM	0.0047uF	5%	50V
C474	1-137-372-11	FILM	0.022uF	5%	50V
		< CONNECTOR >			
* CNP205	1-580-160-11	PIN, CONNECTOR (PC BOARD) 8P			
CNS201	1-695-346-21	PIN, CONNECTOR (PC BOARD) 23P			
		< DIODE >			
D201	8-719-815-85	DIODE 1S1585			
D202	8-719-815-85	DIODE 1S1585			
D203	8-719-815-85	DIODE 1S1585			
D204	8-719-815-85	DIODE 1S1585			
D213	8-719-815-85	DIODE 1S1585			
D214	8-719-815-85	DIODE 1S1585			
D225	8-719-815-85	DIODE 1S1585			
D231	8-719-815-85	DIODE 1S1585			
		< FLUORESCENT INDICATOR >			
FL201	1-517-141-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC201	8-759-587-56	IC uPD78044FGF-145-3B9			
IC202	8-759-962-08	IC BA6208			
IC203	8-749-011-05	IC GP1U28X			

Ref. No.	Part No.	Description			Remark
		< COIL >			
L401	1-410-509-11	INDUCTOR	10uH		
		< TRANSISTOR >			
Q201	8-729-900-63	TRANSISTOR	DTA124ES		
Q202	8-729-900-36	TRANSISTOR	DTC124ES		
Q231	8-729-900-36	TRANSISTOR	DTC124ES		
		< RESISTOR >			
R200	1-247-863-91	CARBON	22K	5%	1/4W
R201	1-247-903-00	CARBON	1M	5%	1/4W
R202	1-249-429-11	CARBON	10K	5%	1/4W
R203	1-249-429-11	CARBON	10K	5%	1/4W
R204	1-249-425-11	CARBON	4.7K	5%	1/4W F
R205	1-249-441-11	CARBON	100K	5%	1/4W
R207	1-249-429-11	CARBON	10K	5%	1/4W
R211	1-247-863-91	CARBON	22K	5%	1/4W
R212	1-247-863-91	CARBON	22K	5%	1/4W
R213	1-247-863-91	CARBON	22K	5%	1/4W
R214	1-247-863-91	CARBON	22K	5%	1/4W
R216	1-247-863-91	CARBON	22K	5%	1/4W
R221	1-247-807-31	CARBON	100	5%	1/4W
R222	1-247-807-31	CARBON	100	5%	1/4W
R223	1-247-807-31	CARBON	100	5%	1/4W
R224	1-247-807-31	CARBON	100	5%	1/4W
R225	1-247-807-31	CARBON	100	5%	1/4W
R226	1-249-441-11	CARBON	100K	5%	1/4W
R227	1-249-441-11	CARBON	100K	5%	1/4W
R228	1-249-412-11	CARBON	390	5%	1/4W F
R231	1-249-427-11	CARBON	6.8K	5%	1/4W F
R232	1-249-411-11	CARBON	330	5%	1/4W
R233	1-249-413-11	CARBON	470	5%	1/4W F
R234	1-249-415-11	CARBON	680	5%	1/4W F
R235	1-247-840-00	CARBON	2.4K	5%	1/4W
R270	1-247-807-31	CARBON	100	5%	1/4W
R283	1-249-427-11	CARBON	6.8K	5%	1/4W F
R284	1-249-427-11	CARBON	6.8K	5%	1/4W F
R286	1-249-437-11	CARBON	47K	5%	1/4W
R420	1-249-415-11	CARBON	680	5%	1/4W F
R421	1-249-430-11	CARBON	12K	5%	1/4W
R422	1-249-422-11	CARBON	2.7K	5%	1/4W F
R423	1-247-903-00	CARBON	1M	5%	1/4W
R424	1-247-903-00	CARBON	1M	5%	1/4W
R470	1-249-415-11	CARBON	680	5%	1/4W F
R471	1-249-430-11	CARBON	12K	5%	1/4W
R472	1-249-422-11	CARBON	2.7K	5%	1/4W F

Ref. No.	Part No.	Description			Remark
R473	1-247-903-00	CARBON	1M	5%	1/4W
R474	1-247-903-00	CARBON	1M	5%	1/4W
		< VARIABLE RESISTOR >			
RV421	1-225-658-11	RES, VAR 100K/100K (BASS)			
RV422	1-225-659-11	RES, VAR 125K/125K (TREBLE)			
RV423	1-225-660-11	RES, VAR 100K/125K (BALANCE)			
		< SWITCH >			
S200	1-554-937-11	SWITCH, KEY BOARD (I/⏻)			
S209	1-554-937-11	SWITCH, KEY BOARD (TUNING -)			
S210	1-554-937-11	SWITCH, KEY BOARD (TUNING +)			
S214	1-554-937-11	SWITCH, KEY BOARD (FM)			
S215	1-554-937-11	SWITCH, KEY BOARD (AM)			
S216	1-554-937-11	SWITCH, KEY BOARD (MEMORY)			
S217	1-554-937-11	SWITCH, KEY BOARD (SURROUND ON/OFF)			
S218	1-554-937-11	SWITCH, KEY BOARD (SET UP)			
S219	1-554-937-11	SWITCH, KEY BOARD (EFFECT DELAY TIME)			
S229	1-554-937-11	SWITCH, KEY BOARD (SHIFT)			
S238	1-554-937-11	SWITCH, KEY BOARD (SURROUND MODE)			
		< VIBRATOR >			
X201	1-577-101-11	VIBRATOR, CERAMIC (4.19MHz)			

****

	1-673-706-11	PHONE JACK BOARD			
		**********			
		< CAPACITOR >			
C792	1-127-876-21	CERAMIC	0.01uF	10%	50V
		< DIODE >			
D791	8-719-815-85	DIODE 1S1585			
		< JACK >			
J741	1-785-959-11	JACK (LARGE TYPE)(PHONE JACK)			
		< RESISTOR >			
R793	1-249-411-11	CARBON	330	5%	1/4W

****

	A-4419-637-A	KEY BOARD, COMPLETE			
		**********			
		< CONNECTOR >			
* CNS205	1-580-169-11	PIN, CONNECTOR (PC BOARD) 8P			
		< DIODE >			
D238	8-719-070-78	DIODE SEL6810A-TP6			
		< RESISTOR >			
R237	1-249-421-11	CARBON	2.2K	5%	1/4W F
R238	1-247-843-11	CARBON	3.3K	5%	1/4W
R239	1-249-411-11	CARBON	330	5%	1/4W

Ref. No.	Part No.	Description			Remark
R240	1-249-413-11	CARBON	470	5%	1/4W F
R241	1-249-415-11	CARBON	680	5%	1/4W F
R242	1-249-417-11	CARBON	1K	5%	1/4W F
R243	1-249-419-11	CARBON	1.5K	5%	1/4W F
R244	1-249-426-11	CARBON	5.6K	5%	1/4W
R246	1-249-411-11	CARBON	330	5%	1/4W
R247	1-249-413-11	CARBON	470	5%	1/4W F
R248	1-249-415-11	CARBON	680	5%	1/4W F
R249	1-249-417-11	CARBON	1K	5%	1/4W F
R280	1-249-419-11	CARBON	1.5K	5%	1/4W F
R281	1-249-421-11	CARBON	2.2K	5%	1/4W F
R282	1-247-843-11	CARBON	3.3K	5%	1/4W
		< SWITCH >			
S221	1-554-937-11	SWITCH, KEY BOARD (CD)			
S222	1-554-937-11	SWITCH, KEY BOARD (TUNER)			
S223	1-554-937-11	SWITCH, KEY BOARD (VIDEO)			
S224	1-554-937-11	SWITCH, KEY BOARD (6)			
S225	1-554-937-11	SWITCH, KEY BOARD (7)			
S226	1-554-937-11	SWITCH, KEY BOARD (8)			
S227	1-554-937-11	SWITCH, KEY BOARD (9)			
S228	1-554-937-11	SWITCH, KEY BOARD (0)			
S231	1-554-937-11	SWITCH, KEY BOARD (TV/SAT)			
S232	1-554-937-11	SWITCH, KEY BOARD (1)			
S233	1-554-937-11	SWITCH, KEY BOARD (2)			
S234	1-554-937-11	SWITCH, KEY BOARD (3)			
S235	1-554-937-11	SWITCH, KEY BOARD (4)			
S236	1-554-937-11	SWITCH, KEY BOARD (5)			
S237	1-554-937-11	SWITCH, KEY BOARD (DIRECT)			
S239	1-554-937-11	SWITCH, KEY BOARD (TAPE/MD)			

****

	A-4419-639-A	MAIN BOARD, COMPLETE			
		**********			
	1-533-217-31	HOLDER, FUSE			
	4-210-380-01	RIVET, NYLON			
	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3			
	7-685-650-91	SCREW +BVTP 3X16 TYPE2 TT(B)			
	7-685-872-09	SCREW +BVTT 3X8 (S)			
		< CAPACITOR >			
C302	1-126-934-11	ELECT	220uF	20%	16V
C303	1-130-494-11	MYLAR	0.082uF	5%	50V
C304	1-137-367-11	FILM	0.0033uF	5%	50V
C305	1-130-494-11	MYLAR	0.082uF	5%	50V
C306	1-126-959-11	ELECT	0.47uF	20%	50V
C307	1-126-964-11	ELECT	10uF	20%	50V
C308	1-126-964-11	ELECT	10uF	20%	50V
C309	1-162-291-31	CERAMIC	560PF	10%	50V
C310	1-126-962-11	ELECT	3.3uF	20%	50V
C311	1-126-961-11	ELECT	2.2uF	20%	50V
C312	1-164-159-21	CERAMIC	0.1uF		50V
C313	1-126-934-11	ELECT	220uF	20%	16V
C314	1-164-159-21	CERAMIC	0.1uF		50V
C315	1-126-934-11	ELECT	220uF	20%	16V
C316	1-124-252-00	ELECT	0.33uF	20%	50V

MAIN

Ref. No.	Part No.	Description			Remark
C317	1-126-934-11	ELECT	220uF	20%	16V
C318	1-136-357-11	FILM	680PF	5%	50V
C322	1-126-962-11	ELECT	3.3uF	20%	50V
C323	1-136-173-00	FILM	0.47uF	5%	50V
C324	1-136-165-00	FILM	0.1uF	5%	50V
C325	1-136-165-00	FILM	0.1uF	5%	50V
C326	1-104-664-11	ELECT	47uF	20%	16V
C327	1-126-959-11	ELECT	0.47uF	20%	50V
C328	1-126-963-11	ELECT	4.7uF	20%	50V
C329	1-126-959-11	ELECT	0.47uF	20%	50V
C330	1-126-963-11	ELECT	4.7uF	20%	50V
C331	1-124-250-11	ELECT	0.15uF	20%	50V
C332	1-126-962-11	ELECT	3.3uF	20%	50V
C333	1-124-250-11	ELECT	0.15uF	20%	50V
C334	1-137-372-11	FILM	0.022uF	5%	50V
C335	1-136-161-00	FILM	0.047uF	5%	50V
C337	1-126-964-11	ELECT	10uF	20%	50V
C338	1-126-964-11	ELECT	10uF	20%	50V
C339	1-126-964-11	ELECT	10uF	20%	50V
C340	1-126-964-11	ELECT	10uF	20%	50V
C341	1-126-934-11	ELECT	220uF	20%	16V
C342	1-126-962-11	ELECT	3.3uF	20%	50V
C343	1-126-962-11	ELECT	3.3uF	20%	50V
C344	1-136-165-00	FILM	0.1uF	5%	50V
C345	1-136-165-00	FILM	0.1uF	5%	50V
C346	1-126-959-11	ELECT	0.47uF	20%	50V
C347	1-126-963-11	ELECT	4.7uF	20%	50V
C348	1-126-959-11	ELECT	0.47uF	20%	50V
C349	1-126-963-11	ELECT	4.7uF	20%	50V
C350	1-124-250-11	ELECT	0.15uF	20%	50V
C351	1-126-962-11	ELECT	3.3uF	20%	50V
C352	1-124-250-11	ELECT	0.15uF	20%	50V
C353	1-164-159-21	CERAMIC	0.1uF		50V
C354	1-164-159-21	CERAMIC	0.1uF		50V
C355	1-164-159-21	CERAMIC	0.1uF		50V
C356	1-164-159-21	CERAMIC	0.1uF		50V
C359	1-126-963-11	ELECT	4.7uF	20%	50V
C360	1-126-963-11	ELECT	4.7uF	20%	50V
C362	1-126-934-11	ELECT	220uF	20%	16V
C364	1-126-934-11	ELECT	220uF	20%	16V
C365	1-126-962-11	ELECT	3.3uF	20%	50V
C406	1-164-159-21	CERAMIC	0.1uF		50V
C408	1-162-294-31	CERAMIC	0.001uF	10%	50V
C411	1-164-159-21	CERAMIC	0.1uF		50V
C412	1-162-291-31	CERAMIC	560PF	10%	50V
C413	1-164-159-21	CERAMIC	0.1uF		50V
C415	1-164-159-21	CERAMIC	0.1uF		50V
C416	1-164-159-21	CERAMIC	0.1uF		50V
C434	1-162-286-21	CERAMIC	220PF	10%	50V
C435	1-162-286-21	CERAMIC	220PF	10%	50V
C501	1-161-494-00	CERAMIC	0.022uF		25V
C502	1-161-494-00	CERAMIC	0.022uF		25V
C503	1-162-207-31	CERAMIC	22PF	5%	50V
C505	1-164-097-11	CERAMIC	0.022uF		50V
C506	1-164-097-11	CERAMIC	0.022uF		50V
C507	1-104-660-11	ELECT	47uF	20%	16V
C508	1-164-097-11	CERAMIC	0.022uF		50V

Ref. No.	Part No.	Description			Remark
C509	1-110-671-31	CERAMIC	47000PF		50V
C511	1-164-096-11	CERAMIC	0.01uF	10%	50V
C512	1-128-551-11	ELECT	22uF	20%	25V
C514	1-110-671-31	CERAMIC	47000PF		50V
C515	1-126-962-11	ELECT	3.3uF	20%	50V
C516	1-110-671-31	CERAMIC	47000PF		50V
C517	1-126-963-11	ELECT	4.7uF	20%	50V
C518	1-104-664-11	ELECT	47uF	20%	16V
C519	1-110-671-31	CERAMIC	47000PF		50V
C520	1-110-671-31	CERAMIC	47000PF		50V
C521	1-110-671-31	CERAMIC	47000PF		50V
C522	1-126-960-11	ELECT	1uF	20%	50V
C523	1-110-671-31	CERAMIC	47000PF		50V
C524	1-126-960-11	ELECT	1uF	20%	50V
C525	1-126-959-11	ELECT	0.47uF	20%	50V
C526	1-126-960-11	ELECT	1uF	20%	50V
C527	1-110-671-31	CERAMIC	47000PF		50V
C528	1-127-882-21	CERAMIC	0.033uF	10%	50V
C529	1-126-964-11	ELECT	10uF	20%	50V
C530	1-162-293-11	CERAMIC	820PF	10%	50V
C531	1-136-158-00	FILM	0.027uF	5%	50V
C532	1-136-160-00	FILM	0.027uF	5%	50V
C533	1-126-964-11	ELECT	10uF	20%	50V
C534	1-126-964-11	ELECT	10uF	20%	50V
C535	1-126-963-11	ELECT	4.7uF	20%	50V
C536	1-126-963-11	ELECT	4.7uF	20%	50V
C537	1-126-933-11	ELECT	100uF	20%	16V
C538	1-126-964-11	ELECT	10uF	20%	50V
C539	1-161-048-00	CERAMIC	0.0056uF	10%	25V
C540	1-161-048-00	CERAMIC	0.0056uF	10%	25V
C541	1-126-933-11	ELECT	100uF	20%	16V
C542	1-164-097-11	CERAMIC	0.022uF		50V
C543	1-126-963-11	ELECT	4.7uF	20%	50V
C544	1-126-959-11	ELECT	0.47uF	20%	50V
C545	1-162-203-31	CERAMIC	15PF	5%	50V
C546	1-162-203-31	CERAMIC	15PF	5%	50V
C548	1-101-001-00	CERAMIC	0.001uF		50V
C549	1-127-876-21	CERAMIC	0.01uF	10%	50V
C601	1-126-961-11	ELECT	2.2uF	20%	50V
C602	1-162-282-31	CERAMIC	100PF	10%	50V
C603	1-126-933-11	ELECT	100uF	20%	16V
C604	1-162-201-31	CERAMIC	12PF	5%	50V
C606	1-104-664-11	ELECT	47uF	20%	35V
C611	1-137-372-11	FILM	0.022uF	5%	50V
C612	1-128-576-11	ELECT	100uF	20%	63V
C620	1-127-881-21	CERAMIC	0.027uF	10%	50V
C651	1-126-961-11	ELECT	2.2uF	20%	50V
C652	1-162-282-31	CERAMIC	100PF	10%	50V
C653	1-126-933-11	ELECT	100uF	20%	16V
C654	1-162-201-31	CERAMIC	12PF	5%	50V
C656	1-104-664-11	ELECT	47uF	20%	35V
C661	1-137-372-11	FILM	0.022uF	5%	50V
C670	1-127-881-21	CERAMIC	0.027uF	10%	50V
C702	1-162-282-31	CERAMIC	100PF	10%	50V
C703	1-126-933-11	ELECT	100uF	20%	16V
C704	1-162-201-31	CERAMIC	12PF	5%	50V
C706	1-104-664-11	ELECT	47uF	20%	35V

Ref. No.	Part No.	Description			Remark
C707	1-128-576-11	ELECT	100uF	20%	63V
C708	1-164-159-21	CERAMIC	0.1uF		50V
C711	1-137-372-11	FILM	0.022uF	5%	50V
C712	1-128-576-11	ELECT	100uF	20%	63V
C720	1-127-881-21	CERAMIC	0.027uF	10%	50V
C721	1-126-934-11	ELECT	220uF	20%	10V
C722	1-126-964-11	ELECT	10uF	20%	50V
C751	1-126-961-11	ELECT	2.2uF	20%	50V
C752	1-162-282-31	CERAMIC	100PF	10%	50V
C753	1-126-933-11	ELECT	100uF	20%	16V
C754	1-162-201-31	CERAMIC	12PF	5%	50V
C756	1-104-664-11	ELECT	47uF	20%	35V
C757	1-128-576-11	ELECT	100uF	20%	63V
C761	1-137-372-11	FILM	0.022uF	5%	50V
C770	1-127-881-21	CERAMIC	0.027uF	10%	50V
C791	1-126-960-11	ELECT	1uF	20%	50V
C796	1-109-889-11	ELECT	1uF	20%	50V
C797	1-109-889-11	ELECT	1uF	20%	50V
C801	1-104-664-11	ELECT	47uF	20%	25V
C802	1-104-664-11	ELECT	47uF	20%	25V
C805	1-137-397-11	FILM	0.047uF	5%	100V
C806	1-137-397-11	FILM	0.047uF	5%	100V
C807	1-104-664-11	ELECT	47uF	20%	25V
C808	1-104-664-11	ELECT	47uF	20%	25V
C809	1-126-960-11	ELECT	1uF	20%	50V
C810	1-126-960-11	ELECT	1uF	20%	50V
C811	1-126-942-61	ELECT	1000uF	20%	25V
C812	1-126-942-61	ELECT	1000uF	20%	25V
C813	1-101-001-00	CERAMIC	0.001uF		50V
C814	1-101-001-00	CERAMIC	0.001uF		50V
C820	1-164-097-11	CERAMIC	0.022uF		50V
C821	1-164-097-11	CERAMIC	0.022uF		50V
C822	1-104-664-11	ELECT	47uF	20%	16V
C823	1-104-664-11	ELECT	47uF	20%	16V
C950	1-126-767-11	ELECT	1000uF	20%	16V
C951	1-164-097-11	CERAMIC	0.022uF		50V
C952	1-126-960-11	ELECT	1uF	20%	50V
C953	1-124-464-11	ELECT	0.22uF	20%	50V
C954	1-126-964-11	ELECT	10uF	20%	50V
C955	1-164-159-21	CERAMIC	0.1uF		50V
		< FILTER >			
CF501	1-760-127-11	FILTER, CERAMIC			
CF502	1-760-127-11	FILTER, CERAMIC			
CF503	1-760-127-11	FILTER, CERAMIC			
		< CONNECTOR >			
* CN701	1-564-778-11	PLUG, CONNECTOR (2.5MM) 4P			
CNS204	1-695-346-21	PIN, CONNECTOR (PC BOARD) 23P			
CNS701	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P			
* CNS802	1-564-778-11	PLUG, CONNECTOR (2.5MM) 4P			
		< CERAMIC VIBRATOR >			
CX301	1-579-952-21	VIBRATOR, CERAMIC (8MHz)			

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D503	8-719-815-85	DIODE 1S1585	
D610	8-719-815-85	DIODE 1S1585	
D620	8-719-815-85	DIODE 1S1585	
D670	8-719-815-85	DIODE 1S1585	
D710	8-719-815-85	DIODE 1S1585	
D720	8-719-815-85	DIODE 1S1585	
D721	8-719-815-85	DIODE 1S1585	
D722	8-719-815-85	DIODE 1S1585	
D723	8-719-815-85	DIODE 1S1585	
D724	8-719-200-82	DIODE 11ES2	
D725	8-719-815-85	DIODE 1S1585	
D770	8-719-815-85	DIODE 1S1585	
D792	8-719-815-85	DIODE 1S1585	
D793	8-719-815-85	DIODE 1S1585	
D801	8-719-922-17	DIODE MTZJ-24B	
D802	8-719-302-38	DIODE RBV-602-01	
D804	8-719-109-85	DIODE RD5.1ES-B2	
D810	8-719-200-82	DIODE 11ES2	
D811	8-719-200-82	DIODE 11ES2	
D812	8-719-200-82	DIODE 11ES2	
D813	8-719-200-82	DIODE 11ES2	
D814	8-719-815-85	DIODE 1S1585	
D815	8-719-815-85	DIODE 1S1585	
D817	8-719-921-74	DIODE MTZN-10A	
D818	8-719-815-85	DIODE 1S1585	
D820	8-719-200-82	DIODE 11ES2	
D821	8-719-200-82	DIODE 11ES2	
D822	8-719-200-82	DIODE 11ES2	
D823	8-719-200-82	DIODE 11ES2	
		< EARTH TERMINAL >	
* G201	1-537-738-21	TERMINAL, EARTH	
* G202	1-537-738-21	TERMINAL, EARTH	
* G203	1-537-738-21	TERMINAL, EARTH	
		< FRONT END >	
FE501	1-693-457-11	TUNER	
		< IC >	
IC301	8-759-527-00	IC LV1035M	
IC302	8-759-634-51	IC M5218AP	
IC401	8-759-805-14	IC LC7822	
IC501	8-759-495-82	IC LA1838	
IC502	8-759-584-70	IC LC72131	
IC701	8-749-921-04	IC STK-4211MK-2	
IC702	8-749-921-04	IC STK-4211MK-2	
IC801	8-759-231-58	IC TA7812S	
IC802	8-759-929-65	IC LM7912CT	
IC950	8-759-333-83	IC NJM2103D	
		< JACK >	
J253	1-770-377-21	JACK, PIN 1P	
J402	1-770-615-21	JACK, PIN 6P	
J403	1-774-005-21	JACK, PIN 6P	

MAIN

Ref. No.	Part No.	Description				Remark
		< COIL >				
L301	1-410-509-11	INDUCTOR	10uH			
L601	1-420-872-00	COIL, AIR-CORE				
L651	1-420-872-00	COIL, AIR-CORE				
L701	1-420-872-00	COIL, AIR-CORE				
L751	1-420-872-00	COIL, AIR-CORE				
		< TRANSISTOR >				
Q303	8-729-141-30	TRANSISTOR	2SC3623A-LK			
Q304	8-729-141-30	TRANSISTOR	2SC3623A-LK			
Q307	8-729-141-30	TRANSISTOR	2SC3623A-LK			
Q308	8-729-141-30	TRANSISTOR	2SC3623A-LK			
Q501	8-729-922-66	TRANSISTOR	2SC2410SN			
Q503	8-729-027-38	TRANSISTOR	DTA144EKA-T146			
Q504	8-729-027-38	TRANSISTOR	DTA144EKA-T146			
Q505	8-729-030-02	TRANSISTOR	DTC144ESA			
Q610	8-729-119-78	TRANSISTOR	2SC403SP-51			
Q620	8-729-140-82	TRANSISTOR	2SA988-PAFAEA			
Q670	8-729-140-82	TRANSISTOR	2SA988-PAFAEA			
Q710	8-729-119-78	TRANSISTOR	2SC403SP-51			
Q720	8-729-140-82	TRANSISTOR	2SA988-PAFAEA			
Q721	8-729-140-82	TRANSISTOR	2SA988-PAFAEA			
Q722	8-729-184-53	TRANSISTOR	2SC1845-EA			
Q723	8-729-119-78	TRANSISTOR	2SC403SP-51			
Q770	8-729-140-82	TRANSISTOR	2SA988-PAFAEA			
Q791	8-729-119-78	TRANSISTOR	2SC27S5TP-HFE			
Q793	8-729-141-30	TRANSISTOR	2SC3623A-LK			
Q794	8-729-141-30	TRANSISTOR	2SC3623A-LK			
Q801	8-729-140-97	TRANSISTOR	2SB734-34			
Q802	8-729-119-78	TRANSISTOR	2SC403SP-51			
Q808	8-729-180-92	TRANSISTOR	2SD809-K			
Q809	8-729-119-78	TRANSISTOR	2SC403SP-51			
Q951	8-729-209-15	TRANSISTOR	2SD2012			
		< RESISTOR >				
R298	1-249-387-11	CARBON	3.3	5%	1/4W	F
R299	1-249-387-11	CARBON	3.3	5%	1/4W	F
R300	1-247-903-00	CARBON	1M	5%	1/4W	
R301	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R302	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R303	1-249-439-11	CARBON	68K	5%	1/4W	
R304	1-249-441-11	CARBON	100K	5%	1/4W	
R305	1-249-429-11	CARBON	10K	5%	1/4W	
R306	1-249-436-11	CARBON	39K	5%	1/4W	
R307	1-247-862-11	CARBON	20K	5%	1/4W	
R308	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R309	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R352	1-249-441-11	CARBON	100K	5%	1/4W	
R353	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R354	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R355	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R356	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R357	1-249-441-11	CARBON	100K	5%	1/4W	
R358	1-249-441-11	CARBON	100K	5%	1/4W	
R359	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R360	1-247-843-11	CARBON	3.3K	5%	1/4W	
R361	1-249-429-11	CARBON	10K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R362	1-249-429-11	CARBON	10K	5%	1/4W	
R363	1-249-411-11	CARBON	330	5%	1/4W	
R402	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R403	1-249-417-11	CARBON	1K	5%	1/4W	F
R404	1-249-417-11	CARBON	1K	5%	1/4W	F
R405	1-249-417-11	CARBON	1K	5%	1/4W	F
R406	1-249-417-11	CARBON	1K	5%	1/4W	F
R407	1-249-417-11	CARBON	1K	5%	1/4W	F
R408	1-249-429-11	CARBON	10K	5%	1/4W	
R409	1-249-417-11	CARBON	1K	5%	1/4W	F
R410	1-249-437-11	CARBON	47K	5%	1/4W	
R414	1-249-425-11	CARBON	4.7K	5%	1/4W	F
R415	1-249-417-11	CARBON	1K	5%	1/4W	F
R420	1-249-441-11	CARBON	100K	5%	1/4W	
R435	1-249-418-11	CARBON	1.2K	5%	1/4W	F
R441	1-249-418-11	CARBON	1.2K	5%	1/4W	F
R442	1-249-418-11	CARBON	1.2K	5%	1/4W	F
R452	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R453	1-249-417-11	CARBON	1K	5%	1/4W	F
R454	1-249-417-11	CARBON	1K	5%	1/4W	F
R455	1-249-417-11	CARBON	1K	5%	1/4W	F
R456	1-249-417-11	CARBON	1K	5%	1/4W	F
R457	1-249-417-11	CARBON	1K	5%	1/4W	F
R458	1-249-429-11	CARBON	10K	5%	1/4W	
R459	1-249-417-11	CARBON	1K	5%	1/4W	F
R460	1-249-437-11	CARBON	47K	5%	1/4W	
R465	1-249-417-11	CARBON	1K	5%	1/4W	F
R470	1-249-441-11	CARBON	100K	5%	1/4W	
R501	1-249-422-11	CARBON	2.7K	5%	1/4W	F
R502	1-249-415-11	CARBON	680	5%	1/4W	F
R503	1-247-791-91	CARBON	22	5%	1/4W	
R504	1-249-393-11	CARBON	10	5%	1/4W	F
R505	1-249-411-11	CARBON	330	5%	1/4W	
R506	1-247-891-00	CARBON	330K	5%	1/4W	
R507	1-249-417-11	CARBON	1K	5%	1/4W	F
R508	1-249-411-11	CARBON	330	5%	1/4W	
R511	1-249-441-11	CARBON	100K	5%	1/4W	
R512	1-249-441-11	CARBON	100K	5%	1/4W	
R513	1-249-425-11	CARBON	4.7K	5%	1/4W	
R514	1-249-418-11	CARBON	1.2K	5%	1/4W	F
R515	1-249-410-11	CARBON	270	5%	1/4W	F
R516	1-249-402-11	CARBON	56	5%	1/4W	F
R517	1-247-842-11	CARBON	3K	5%	1/4W	
⚠R519	1-249-403-11	CARBON	68	5%	1/4W	F
R521	1-249-426-11	CARBON	5.6K	5%	1/4W	
R531	1-249-425-11	CARBON	4.7K	5%	1/4W	
R532	1-249-425-11	CARBON	4.7K	5%	1/4W	
R535	1-249-418-11	CARBON	1.2K	5%	1/4W	F
R536	1-249-417-11	CARBON	1K	5%	1/4W	F
R537	1-249-420-11	CARBON	1.8K	5%	1/4W	F
R538	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R539	1-249-427-11	CARBON	6.8K	5%	1/4W	F
⚠R541	1-249-403-11	CARBON	68	5%	1/4W	F
R542	1-249-420-11	CARBON	10K	5%	1/4W	F
R543	1-249-429-11	CARBON	10K	5%	1/4W	
R544	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R545	1-249-425-11	CARBON	4.7K	5%	1/4W	F

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R546	1-247-807-31	CARBON	100	5%	1/4W
R547	1-249-425-11	CARBON	4.7K	5%	1/4W F
R548	1-249-421-11	CARBON	2.2K	5%	1/4W F
R549	1-249-429-11	CARBON	10K	5%	1/4W
R550	1-249-417-11	CARBON	1K	5%	1/4W F
R553	1-249-417-11	CARBON	1K	5%	1/4W F
R554	1-249-429-11	CARBON	10K	5%	1/4W
R555	1-247-843-11	CARBON	3.3K	5%	1/4W
R556	1-249-417-11	CARBON	1K	5%	1/4W F
R557	1-249-417-11	CARBON	1K	5%	1/4W F
R558	1-249-417-11	CARBON	1K	5%	1/4W F
R559	1-247-863-91	CARBON	22K	5%	1/4W
R561	1-247-843-11	CARBON	3.3K	5%	1/4W
R601	1-249-421-11	CARBON	2.2K	5%	1/4W F
R602	1-249-438-11	CARBON	56K	5%	1/4W
R603	1-249-412-11	CARBON	390	5%	1/4W F
R604	1-249-438-11	CARBON	56K	5%	1/4W
R605	1-247-760-11	CARBON	4.7K	5%	1/2W F
R606	1-249-425-11	CARBON	4.7K	5%	1/4W F
⚠R610	1-220-755-11	METAL	0.22	10%	2W
⚠R617	1-249-393-11	CARBON	10	5%	1/4W F
R618	1-249-389-11	CARBON	4.7	5%	1/4W F
⚠R619	1-249-405-11	CARBON	100	5%	1/4W F
R620	1-249-420-11	CARBON	1.8K	5%	1/4W F
R621	1-247-815-91	CARBON	220	5%	1/4W
⚠R622	1-249-403-11	CARBON	68	5%	1/4W F
R623	1-249-437-11	CARBON	47K	5%	1/4W
R630	1-249-426-11	CARBON	5.6K	5%	1/4W
R631	1-247-887-00	CARBON	220K	5%	1/4W
R632	1-249-426-11	CARBON	5.6K	5%	1/4W
R651	1-249-421-11	CARBON	2.2K	5%	1/4W F
R652	1-249-438-11	CARBON	56K	5%	1/4W
R653	1-249-412-11	CARBON	390	5%	1/4W F
R654	1-249-438-11	CARBON	56K	5%	1/4W
R656	1-249-425-11	CARBON	4.7K	5%	1/4W F
⚠R660	1-220-755-11	METAL	0.22	10%	2W
R665	1-247-760-11	CARBON	4.7K	5%	1/2W F
⚠R667	1-249-393-11	CARBON	10	5%	1/4W F
R668	1-249-389-11	CARBON	4.7	5%	1/4W F
R670	1-249-420-11	CARBON	1.8K	5%	1/4W F
⚠R671	1-247-815-91	CARBON	220	5%	1/4W
R672	1-249-431-11	CARBON	15K	5%	1/4W
R673	1-249-437-11	CARBON	47K	5%	1/4W
R674	1-249-431-11	CARBON	15K	5%	1/4W
R701	1-249-421-11	CARBON	2.2K	5%	1/4W F
R702	1-249-438-11	CARBON	56K	5%	1/4W
R703	1-249-412-11	CARBON	390	5%	1/4W F
R704	1-249-438-11	CARBON	56K	5%	1/4W
R705	1-247-760-11	CARBON	4.7K	5%	1/2W F
R706	1-249-425-11	CARBON	4.7K	5%	1/4W F
⚠R707	1-249-405-11	CARBON	100	5%	1/4W F
⚠R710	1-220-755-11	METAL	0.22	10%	2W
R711	1-249-405-11	CARBON	100	5%	1/4W F
⚠R717	1-249-393-11	CARBON	10	5%	1/4W F
R718	1-249-389-11	CARBON	4.7	5%	1/4W F
⚠R719	1-249-405-11	CARBON	100	5%	1/4W F

Ref. No.	Part No.	Description			Remark
R720	1-249-420-11	CARBON	1.8K	5%	1/4W F
R721	1-247-815-91	CARBON	220	5%	1/4W
⚠R722	1-249-403-11	CARBON	68	5%	1/4W F
R723	1-249-437-11	CARBON	47K	5%	1/4W
R724	1-249-425-11	CARBON	4.7K	5%	1/4W F
R725	1-249-427-11	CARBON	6.8K	5%	1/4W F
R727	1-247-752-11	CARBON	1K	5%	1/2W F
R730	1-249-426-11	CARBON	5.6K	5%	1/4W
R731	1-249-426-11	CARBON	5.6K	5%	1/4W
R732	1-247-753-11	CARBON	1.2K	5%	1/2W F
R733	1-247-753-11	CARBON	1.2K	5%	1/2W F
R734	1-249-429-11	CARBON	10K	5%	1/4W
R751	1-249-421-11	CARBON	2.2K	5%	1/4W F
R752	1-249-438-11	CARBON	56K	5%	1/4W
R753	1-249-412-11	CARBON	390	5%	1/4W F
R754	1-249-438-11	CARBON	56K	5%	1/4W
R755	1-247-760-11	CARBON	4.7K	5%	1/2W F
R756	1-249-425-11	CARBON	4.7K	5%	1/4W F
⚠R757	1-249-405-11	CARBON	100	5%	1/4W F
⚠R760	1-220-755-11	METAL	0.22	10%	2W
⚠R767	1-249-393-11	CARBON	10	5%	1/4W F
R768	1-249-389-11	CARBON	4.7	5%	1/4W F
R770	1-249-420-11	CARBON	1.8K	5%	1/4W F
R771	1-247-815-91	CARBON	220	5%	1/4W
R772	1-249-431-11	CARBON	15K	5%	1/4W
R773	1-249-437-11	CARBON	47K	5%	1/4W
R774	1-249-431-11	CARBON	15K	5%	1/4W
R781	1-247-887-00	CARBON	220K	5%	1/4W
R782	1-247-753-11	CARBON	1.2K	5%	1/2W F
R783	1-247-753-11	CARBON	1.2K	5%	1/2W F
R791	1-249-441-11	CARBON	100K	5%	1/4W
R792	1-249-441-00	CARBON	100K	5%	1/4W
⚠R803	1-247-739-11	CARBON	100	5%	1/2W F
R804	1-249-425-11	CARBON	4.7K	5%	1/4W F
⚠R810	1-249-381-11	CARBON	1	5%	1/4W F
⚠R811	1-249-381-11	CARBON	1	5%	1/4W F
R821	1-249-437-11	CARBON	47K	5%	1/4W
R822	1-249-425-11	CARBON	4.7K	5%	1/4W F
R823	1-249-437-11	CARBON	47K	5%	1/4W
R824	1-249-425-11	CARBON	4.7K	5%	1/4W F
R825	1-249-407-11	CARBON	150	5%	1/4W F
⚠R830	1-249-405-11	CARBON	100	5%	1/4W F
⚠R831	1-249-403-11	CARBON	68	5%	1/4W F
R950	1-249-421-11	CARBON	2.2K	5%	1/4W F
R951	1-249-429-11	CARBON	10K	5%	1/4W
R952	1-247-843-11	CARBON	3.3K	5%	1/4W
R953	1-247-863-91	CARBON	22K	5%	1/4W
R954	1-249-439-11	CARBON	68K	5%	1/4W
R955	1-249-429-11	CARBON	10K	5%	1/4W
R956	1-247-843-11	CARBON	3.3K	5%	1/4W
R957	1-249-417-11	CARBON	1K	5%	1/4W F
R958	1-249-401-11	CARBON	47	5%	1/4W F
R960	1-249-429-11	CARBON	10K	5%	1/4W
		< RELAY >			
RY601	1-515-921-11	RELAY (12V)			
RY701	1-515-921-11	RELAY (12V)			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
RY801	1-755-013-11	RELAY	
		< SFR >	
SFR501	1-238-599-11	RES, ADJ, CARBON 4.7K	
		< TRANSFORMER >	
T502	1-234-304-11	ENCAPSULATED COMPONENT	
T503	1-233-885-11	ENCAPSULATED COMPONENT	
T504	1-234-305-11	ENCAPSULATED COMPONENT (LPF)	
T505	1-234-305-11	ENCAPSULATED COMPONENT (LPF)	
		< TERMINAL >	
TM1	1-537-240-51	TERMINAL BOARD (CHECKER PIN)	
TM601	1-537-923-11	TERMINAL BOARD (SPEAKER) (6P)	
TM701	1-537-240-11	TERMINAL BOARD (CHECKER PIN)	
		< VIBRATOR >	
X501	1-781-385-11	VIBRATOR, CRYSTAL (7.2MHz)	
**********			
	1-673-708-11	PRIMARY BOARD	
		**********	
		< CONNECTOR >	
CNP903	1-564-321-00	PIN, CONNECTOR 2P	
		< FUSE >	
⚠F901	1-576-109-11	FUSE (5A/125V)	
		< TRANSFORMER >	
⚠T901	1-433-879-11	TRANSFORMER, POWER	
**********			
	1-673-707-11	SECONDARY BOARD	
		**********	
		< CONNECTOR >	
CNS801	1-764-480-11	PIN, CONNECTOR (PC BOARD) 11P	
**********			
	1-673-705-11	STANDBY BOARD	
		**********	
		< CONNECTOR >	
CNJ902	1-540-057-11	OUTLET, AC (POLAR)	
CNS301	1-568-828-11	PIN, CONNECTOR (PC BOARD) 9P BOARD	
		< DIODE >	
D816	8-719-815-85	DIODE 1S1585	
		< EARTH TERMINAL >	
* G900	1-537-738-21	TERMINAL, EARTH	

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R901	1-202-725-00	SOLID	3.3M	10%	1/2W
		< RELAY >			
RY901	1-755-018-11	RELAY			
		< TRANSFORMER >			
⚠T901	1-431-258-31	TRANSFORMER, POWER			
**********					
	A-4419-635-A	VOL-TONE BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C420	1-162-207-31	CERAMIC	22PF	5%	50V
C426	1-126-795-11	ELECT	10uF	20%	25V
C427	1-124-252-00	ELECT	0.33uF	20%	50V
C428	1-130-489-00	MYLAR	0.033uF	5%	50V
C429	1-102-973-00	CERAMIC	100PF	5%	50V
C430	1-104-942-11	ELECT	1uF	20%	50V
C431	1-104-942-11	ELECT	1uF	20%	50V
C432	1-126-795-11	ELECT	10uF	20%	25V
C433	1-126-795-11	ELECT	10uF	20%	25V
C470	1-162-207-31	CERAMIC	22PF	5%	50V
C475	1-126-795-11	ELECT	10uF	20%	25V
C476	1-126-795-11	ELECT	10uF	20%	25V
C477	1-124-252-00	ELECT	0.33uF	20%	50V
C478	1-130-489-00	MYLAR	0.033uF	5%	50V
C479	1-102-973-00	CERAMIC	100PF	5%	50V
C492	1-124-464-11	ELECT	0.22uF	20%	50V
		< CONNECTOR >			
CNS402	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P			
CNS403	1-568-828-11	PIN, CONNECTOR (PC BOARD) 9P			
		< DIODE >			
D421	8-719-815-85	DIODE 1S1585			
		< IC >			
IC404	8-759-634-51	IC M5218AP			
		< TRANSISTOR >			
Q401	8-729-202-67	TRANSISTOR 2SK246-GR3			
Q402	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q451	8-729-202-67	TRANSISTOR 2SK246-GR3			
Q452	8-729-141-30	TRANSISTOR 2SC3623A-LK			
		< RESISTOR >			
R425	1-249-429-11	CARBON	10K	5%	1/4W
R426	1-249-439-11	CARBON	68K	5%	1/4W
R427	1-249-417-11	CARBON	1K	5%	1/4W F
R430	1-249-437-11	CARBON	47K	5%	1/4W
R431	1-247-843-11	CARBON	3.3K	5%	1/4W
R432	1-247-883-00	CARBON	150K	5%	1/4W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R433	1-249-427-11	CARBON	6.8K	5%	1/4W F
R434	1-249-413-11	CARBON	470	5%	1/4W F
R438	1-249-441-11	CARBON	100K	5%	1/4W
R441	1-249-441-11	CARBON	100K	5%	1/4W
R464	1-247-903-00	CARBON	1M	5%	1/4W
R469	1-247-903-00	CARBON	1M	5%	1/4W
R475	1-249-429-11	CARBON	10K	5%	1/4W
R476	1-249-439-11	CARBON	68K	5%	1/4W
R477	1-249-417-11	CARBON	1K	5%	1/4W F
R480	1-249-437-11	CARBON	47K	5%	1/4W
R481	1-247-843-11	CARBON	3.3K	5%	1/4W
R482	1-247-883-00	CARBON	150K	5%	1/4W
R483	1-249-427-11	CARBON	6.8K	5%	1/4W F
R484	1-249-413-11	CARBON	470	5%	1/4W F
R491	1-249-441-11	CARBON	100K	5%	1/4W
R492	1-247-903-00	CARBON	1M	5%	1/4W
		< VARIABLE RESISTOR >			
RV404	1-225-229-11	RES, VAR, CARBON 100KX4 (MASTER VOLUME)			

****

MISCELLANEOUS
****

9	1-782-100-11	WIRE (FLAT TYPE) (23 CORE)
13	1-782-074-11	WIRE (FLAT TYPE) (7 CORE)
14	1-782-075-11	WIRE (FLAT TYPE) (9 CORE)
⚠56	1-783-531-21	CORD, POWER
FL201	1-517-141-11	INDICATOR TUBE, FLUORESCENT
⚠T901	1-431-258-31	TRANSFORMER, POWER

****

ACCESSORIES & PACKING MATERIALS
****

1-475-710-11	COMMANDER, STANDARD (RM-U302)
1-501-374-11	ANTENNA, LOOP
1-501-659-41	ANTENNA (FM)
3-866-100-01	MANUAL, INSTRUCTION (ENGLISH)
4-981-643-01	COVER, BATTERY (for RM-U302)

****

****
HARDWARE LIST
****

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S
#3	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3
#3	7-685-650-91	SCREW +BVTP 3X16 TYPE2 TT(B)
#4	7-685-872-09	SCREW +BVTT 3X8 (S)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-928-834-11

Sony Corporation
Home A&V Products Company

99D097020-1
Printed in Singapore © 1999. 4
Published by Quality Assurance Dept.
(Shinagawa)